# Marine Engineering and Shipping Age

**Volume XXVIII** **August, 1923** **No. 8**

Published Monthly by
ALDRICH PUBLISHING COMPANY
In Conjunction With
SIMMONS-BOARDMAN PUBLISHING COMPANY
30 Church Street, New York
F. B. WEBSTER, Editor
H. H. BROWN, Managing Editor
L. S. BLODGETT, Associate Editor W. Z. GARDNER, News Editor

*Contributing Editors*

Rear Admiral C. W. Dyson, U. S. N. William T. Donnelly
Commander S. M. Robinson, U. S. N. H. McL. Harding
William Gatewood James L. Bates
Captain C. A. McAllister, U.S.C.G. (Retired)

MARINE ENGINEERING AND SHIPPING AGE is a member of the Associated Business Papers, Inc. (A. B. P.), National Association of Periodical Publishers, Inc., New York Business Publishers' Association and the Audit Bureau of Circulation (A. B. C.).

Requests for change of address should reach us two weeks before the date of the issue with which it is to go into effect. It is difficult, and often impossible, to supply back numbers to replace those undelivered through failure to send advance notice. In sending us change of address, please be sure to send us your old address as well as the new one.

## A Real Saving

THE Fuel Conservation Committee created by Mr. Joseph E. Sheedy, vice-president of the Emergency Fleet Corporation, has accomplished a real saving in the amount of fuel consumed on Government ships. In spite of the increase of ship-miles covered by Shipping Board vessels and the material advance in the price of oil, the monthly expenditure for fuel has been kept at a constant figure. It is significant that, during the life of the committee, practically every other operating cost has, due to the higher prices of material and labor, been materially increased. This gratifying showing is due apparently to advantageous fuel oil contracts and also in considerable measure to the work of the Fuel Conservation Committee.

Fuel is the largest direct operating cost and the logical place to make the greatest saving. With this in mind the fuel committee had estimates made of the number of miles every Government ship in operation ought to make on a ton of fuel. When these figures were furnished to the chief engineers there was an immediate improvement in efficiency for they were an incentive for every engineer to do his best. They gave him a mark to shoot at and they also gave him the knowledge that someone was taking an interest in his personal work. It is human nature for good men to do their best when they know that credit will be given honest efforts.

Of course there were cases where the efficiency obtained was not what it should be and in such instances a thorough investigation was made to determine the cause. A notable case where a great improvement was accomplished was on the *America* where changes in the boilers effected very large savings.

In addition to this, the Fuel Committee organized a school for engineers through the courtesy of the Navy Department at the testing plant of the Philadelphia Navy Yard. Here an intensive five-day course in the art of burning oil has been carried on since November. It has been open to engineers of both Government and privately-owned ships. The greatest endorsement that can be given to this school is the fact that the graduates have spread the news of the benefits that they have derived from taking this course to such good effect that it has been necessary to double the number of the classes.

Economy is the ideal of all true engineers. The avoidance of waste is one of Secretary Hoover's pet hobbies. Getting the business is important, freight rates are important but it is also true that those who have made the greatest success in shipping are those who have paid the best attention to reducing costs. Those who like their work will do it efficiently.

## Two More Fast Ships Needed

IT is very gratifying to note the interest that the general public has taken in the *Leviathan*. Her reconditioning into a premier ocean liner has been accomplished with such skill that every American ought to be proud of the work of the Newport News Shipbuilding and Dry Dock Company and, judging from the amount of newspaper publicity that has been given to this great ship, something resembling that pride which our ancestors took in shipping has been revived in the public at large.

But the *Leviathan* has not and will not have a fair chance to make a financial success unless and until two more ships capable of making at least twenty knots are built and placed on the berth with her. This fact is well known to our foreign competitors, especially those who are at present prepared and do furnish a weekly express service.

Passengers cannot be expected whether going or returning to wait three weeks for a particular ship and, as to the forwarders of express freight, who are given a weekly service by English vessels, it will be out of the question no matter how patriotic they may be to expect them to disrupt their business and interrupt the fast delivery of their products in order to favor the *Leviathan*.

It is unfortunate that the age of the *Agamemnon* and *Mt. Vernon* and the cost of reconditioning them are such that the Shipping Board has felt it necessary to condemn the project of returning them to service. Whether or not they would



Generated on 2024-09-12 16:18 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

make a financial return on their conversion cost, they would at least fill a gap until they could be replaced with new ships and they might, in this way, be the means of deciding the destiny of one of our two great American translantic steamship lines.

Our great fleet of freight ships cost us many times what the Shipping Board would be only too glad to accept for them now. We hear a lot about the cost of their construction, but we hear very little about what these ex-German liners saved us in transporting troops. We would have paid to the owners of the *Leviathan* alone, if she had been under foreign control, something like $42,000,000 for the passage money of the soldiers that she carried.

In other words, the ex-German liners have a credit balance for actual services on the ledger which ought amply to justify the construction of two new vessels. Naval experts know the actual need for such ships under American control, which is decidedly more urgent since the Disarmament Conference, and shipping experts know that they are absolutely necessary as running mates for the *Leviathan*. We must and will get these ships and, when we do, we will be just as proud of them as we are of our premier ship today.

## Marine Insurance Dull

MARINE underwriters are viewing the business let-down of the last few weeks with misgivings. They are wondering whether it is merely a seasonal reaction, or an ominous attestation of the commercial decline of which one hears so much these days. Beyond question, the prevailing scale of prices in the United States, due to high costs of production, puts Americans at a considerable disadvantage in the export of manufactured goods. Dull foreign trade means dull marine insurance. It is the general opinion that underwriters made no money during the first half of 1923. Losses have been heavy and premiums have scarcely equaled the volume for the corresponding period of last year. The summer months are bringing little relief. The likelihood of profit in 1923 is steadily growing more and more remote. It seems certain that our export of manufactured products will continue to decline in comparison with the export trade of other countries, and the more progress Europe makes in getting on her feet, the more competition will this country feel in her export trade of manufactured merchandise. The bright side of the apparent cloud lies in the reflection in our raw products' trade, such as copper, cotton, grains, etc., of future orders from abroad when European nations get more upon their feet and undertake an expansion of their business. This is the time for sound sense and the best brand of courage we can all command.

## Writing the Rum-Runners

MARINE underwriters are frequently queried concerning the liability for damage to vessels and cargoes arising out of the activity of that class of bootleggers known as rum-runners. And not without reason. From time to time reports reach shore of collisions with mysterious craft and of damage done vagrant vessels and legitimate carriers alike; and the source of this injury is clouded and obscure. Too often the rum-runner is in the offing and to blame for the disaster. What are the rights of all concerned in this case, so far as their insurance protection goes?

The legality of the venture is one of the implied warranties of marine insurance. This, naturally, precludes recovery under American policies for damage to vessels engaged in rum-running, or to their cargoes. Under the laws of misrepresentation and concealment, it would appear to be incumbent upon the party seeking insurance to make known to the insurer the character of the business in which the applicant is engaged. Damage to a vessel engaged in legal trade, due to collision with a smuggler, is, of course, recoverable under the American policy. However, there would not be much difficulty for an American to obtain insurance in Great Britain covering smuggling operations, because the United Kingdom does not recognize the laws of a foreign nation to the extent of permitting such laws to invalidate contracts made in Great Britain when the contract is within the British law. It would appear, therefore, that any protection desired in this form of activity must be sought outside the United States.

## Deviation Charges

IT is not always clear to shippers why they should be charged extra for a deviation from the set route at sea. They complain to their underwriters that they have not profited by such a change of course and ought not to have to pay on account of it. There is good and sufficient reason, just the same. When the insurer makes up his rate he takes into careful consideration every hazard involved in sailing from one given point to another, along an agreed course. The moment the voyage is altered and additional harbors are made there arise numerous hazards that he had not taken into account. No vessel can enter and leave a harbor without running increased risk of collision and stranding, not to mention perils involved in the opening of hatches for coaling or cargoing the vessel, one of the most dangerous of which is fire.

Illustrations abound in substantiation of this attitude of the underwriter. A short time ago a large Lamport & Holt liner went aground at Bermuda when entering the channel off Hamilton, and her position, for a time, threatened to prevent the entrance of a regular steamer of call. She was bound to New York from South America, and although the bill of lading may not have construed a stop at Bermuda as a deviation it most certainly was such by the terms of the insurance policy. Fortunately the steamer was floated in time to save the insurers a heavy loss, but it might easily have cost the New York insurance district thousands of dollars. The Pacific Coast, several months ago, supplied a still more dramatic illustration of the perils involved in deviations. The *Welsh Prince* went aground in an attempt to deviate for extra cargo at Portland, Ore., and became a total loss. The underwriters were called upon to foot the bill, which ran into a round million dollars. Is this not a hazard worth an additional rate? And the charge is trifling —only from five cents to seven and a half cents per hundred dollars. It can scarcely be considered exorbitant.

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Leviathan Awakens America's Interest in Shipping

## Race with Majestic Would Stimulate Favorable Public Opinion—Two More Ships Comparable in Speed Needed to Establish Weekly Service

**By "Old Scotch"**

TO the American marine public, torn with conflicting emotions as to our future and jaded with continuous depression in business the completion and official trials of the *Leviathan* came at a psychological time to stir up shipping sentiment as no other event has done in several years.

The attack of partisan journals on the so-called "joy ride at the tax-payer's expense" riveted public attention to this "Queen of the Seas" as nothing else could have done. Since the advent of the *Great Eastern,* over seventy-five years ago, no single ship has ever been so much in the public eye, not alone in this country but in every maritime country in the world. Chairman Lasker, professional advertising man as he is, could have devised no better means for putting this great ship on the map than the trial trip which he initiated, supervised and brought to such a successful ending. Threats of injunctions and Congressional investigations deterred him not, for he was assured by all experienced shipping men that he was pursuing a perfectly legitimate and necessary course. The small additional sum to feed the guests on board during the trial paled into insignificance in comparison with the financial returns which will accrue as a direct result of the wonderful amount of advertising resulting from the newspaper attacks.

What rival steamship line would not have pulled off a much more expensive trial, if they could have been reasonably sure of even one-half the gratuitous advertising which the *Leviathan's* trial received?

### The Leviathan's Speed

The announced speed obtained meant just exactly what it stated, no more, no less. That it was made in the Gulf Stream, with possibly three or four knots favoring current, is known to all who are familiar with shipping. All the crack runs of rival ships, let it be noted, are given out on the eastbound trips, where the Gulf Stream is an advantage. Why have not rival ships given out record runs westbound? The answer is for the same reason as those obtaining for the *Leviathan's* run—*advertising.* The public at large little care for attendant circumstances. Americans for once out-advertised foreign competitors by taking advantage of a little more current than the other fellows.

### Race with the Majestic Proposed

As a really sporting proposition none of those "record runs" of rival greyhounds amount to anything in the minds of seafaring people. Conditions of wind, sea and currents vary so much at sea, that it is not alone impossible but inadvisable to consider seriously the record made by any ship which speeds alone on ocean lanes. Spasmodically we indulge in International yacht races, where all competitors are on an equal basis as to weather and tidal conditions. There, real class of vessel and skill of navigators are at stake. At this time the greatest sporting event on the ocean that the world has ever seen would be to put the *Leviathan* and the *Majestic,* for example, side by side off Ambrose Light, give them an even start and the first one to reach Daunt's Rock or Cherbourg Breakwater can well be proclaimed the better ship. Then all arguments about sea temperatures, favoring currents or weather conditions would be dispelled. It would be a battle royal between engineers and navigators of the United States and Great Britain. Needless to say every available inch of passenger accommodations would be taken on both ships.

The ludicrous part of such a race would be the fact that America and England would be battling for transatlantic supremacy with German-built ships. Even so, they have both been overhauled and reconditioned by the best talent in England and America, and the test would be fairly indicative of the available skill in both countries, in shipyards and among sea-goers.

Such a race would attract the attention of every citizen in both countries no matter how remote they might be from the seaboard. All English speaking people go in for fair sports and, instead of engendering any ill-feeling between the two great Anglo-Saxon nations, the reverse would undoubtedly result.

The benefit to the American merchant marine would be incalculable. The farmers and cowboys of our great inland empire would no doubt be as much interested and excited over such an international contest as the people living along our seaboards. If perchance our pet ship should be whipped, it is dollars to doughnuts that we would go after the championship with renewed vigor, and the next contestant flying our flag would be a ship designed and built in our own yards, and manned by our own people throughout.

It is safe to say that the American merchant marine has already received more of an impetus from the great publicity attached to the *Leviathan* trials than it did from all the campaign of education which we launched during the consideration of the late-lamented shipping bill. All it needs now to put over the great idea of American ships is to stage a *Leviathan-Majestic* overseas race. From quoted expressions of British captains, they are willing to engage in such an encounter. Are we not just as good sportsmen, and have we ever before been unwilling to back up our own ships in any contest of this kind? Newspaper records with all the attendant bluffs get us nowhere. Let's be game!

### Passengers Enthusiastic Over Vessel's Performance

The fortunate guests who participated in the now famous trial of the *Leviathan* were as representative a body of Americans as have ever been gathered together in any ship under the American flag. Leading men in the shipping business, railroad presidents, great business men, prominent journalists, and well known citizens from all parts of the country mingled together and got a better idea of the possibilities of an American merchant marine than could be obtained in any manner ever devised. Their enthusiasm was unbounded, as is best evidenced by the spirit displayed in raising in a few moments a purse of six thousand dollars to be distributed among the engineering force, whom they readily saw were the portion of the crew to whom credit for the splendid performance was due. Incidentally, this is probably the first instance on record where favors and praise were bestowed on the right people for a creditable performance of a steamship.

A further evidence of the fine spirit developed, was the announcement of several very prominent business men who were on board, to the effect that hereafter their buyers, who make hundreds of trips annually to Europe, would be directed to patronize American ships exclusively. That development alone was worth more than the entire expenses of the trial trip. When we consider that over seventy-five per-



Generated on 2024-09-12 16:19 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

cent of all money spent in transporting persons and goods between the United States and Europe emanates from our own pockets, is it not time that we gave heed to keeping a fair proportion of this money at home?

### The Leviathan Goes Into Service

The sailing of the *Leviathan* on Independence Day was witnessed by a crowd of over 15,000 people massed around her pier, and by countless thousands from the densely populated portions of the great city bordering on or in sight of the harbor. The weather conditions at the time may be, we trust, quite prophetic of the future of our shipping efforts. She started to back out from the wharf promptly at the appointed hour amid the din of steam whistles and the whirring of airplanes overhead, but the heavens broke loose with an inundation of rain which compelled every one to scatter for shelter. She started majestically down the harbor under dark, lowering clouds and an atmosphere through which it was most difficult to grope. Before reaching the open sea, the clouds had disappeared and the brilliant July sunshine made the spectacle of America's pride starting on her first voyage a marine spectacle long to be pleasantly remembered.

Although our merchant marine endeavors are now struggling with adverse conditions, who can or will say that these temporary clouds will not soon disappear, and that the warm sunshine of public approval and a determination to succeed will not eventuate in scattering the clouds of adversity which up to this time have tended to discourage us?

### Two More Fast Ships Should be Built

It will be difficult and, in fact, impossible to maintain adequate service under the American flag with but one first-class vessel like the *Leviathan*. Let us all get behind the Shipping Board's announced policy of asking Congress to appropriate money to construct two more comparable ships for the North Atlantic trade, so that Americans can travel to distant lands under our own flag. The Board has the money and all that Congress needs do is to make it available for this new construction. Our yards are at present capable of turning out two ships which will lead the world for comfort, size and speed. In a few years under the present outlook, we will not have the necessary facilities and talent for building such ships.

Our national pride and the dictates of self defense and commonsense all demand that we should build two such ships. A trio of such fast and commodious vessels are absolute essentials in our program of national defense, and, for that purpose alone, the expenditure of the necessary money would be more than justifiable. With the proper national spirit behind them, such as has already been started by the advent of the *Leviathan*, there is but little question that they would be a good instrument financially, either in public or private hands.

Let us all unite in the toast "Hail *Leviathan* Redivivus, and may good luck attend you everywhere!"

---

Auxiliary Sailing Houseboat Launched.—Mr. Fred S. Fish's auxiliary sailing houseboat *Moby Dick*, designed by Henry J. Gielow, Inc., New York, which was launched at the Harlan Plant of the Bethlehem Shipbuilding Corporation, Ltd., Wilmington, Del., on June 30 is an interesting example of a high grade craft of a type especially designed and adapted for shallow draft cruising in localities such as the Florida waters. It is the second of the same type to be launched this season at the Harlan Plant, the other being Mr. Keith Spalding's auxiliary schooner yacht *Goodwill*. The auxiliary power is furnished by a Diesel engine and ample accommodations have been provided for guests and crew, quarters being available for ten of the former and eight of the latter. The vessel is 120 feet long overall, 24 feet 8 inches molded beam, 10 feet 8 7/16 inches molded depth and will have a draft of 6 feet 10 inches.

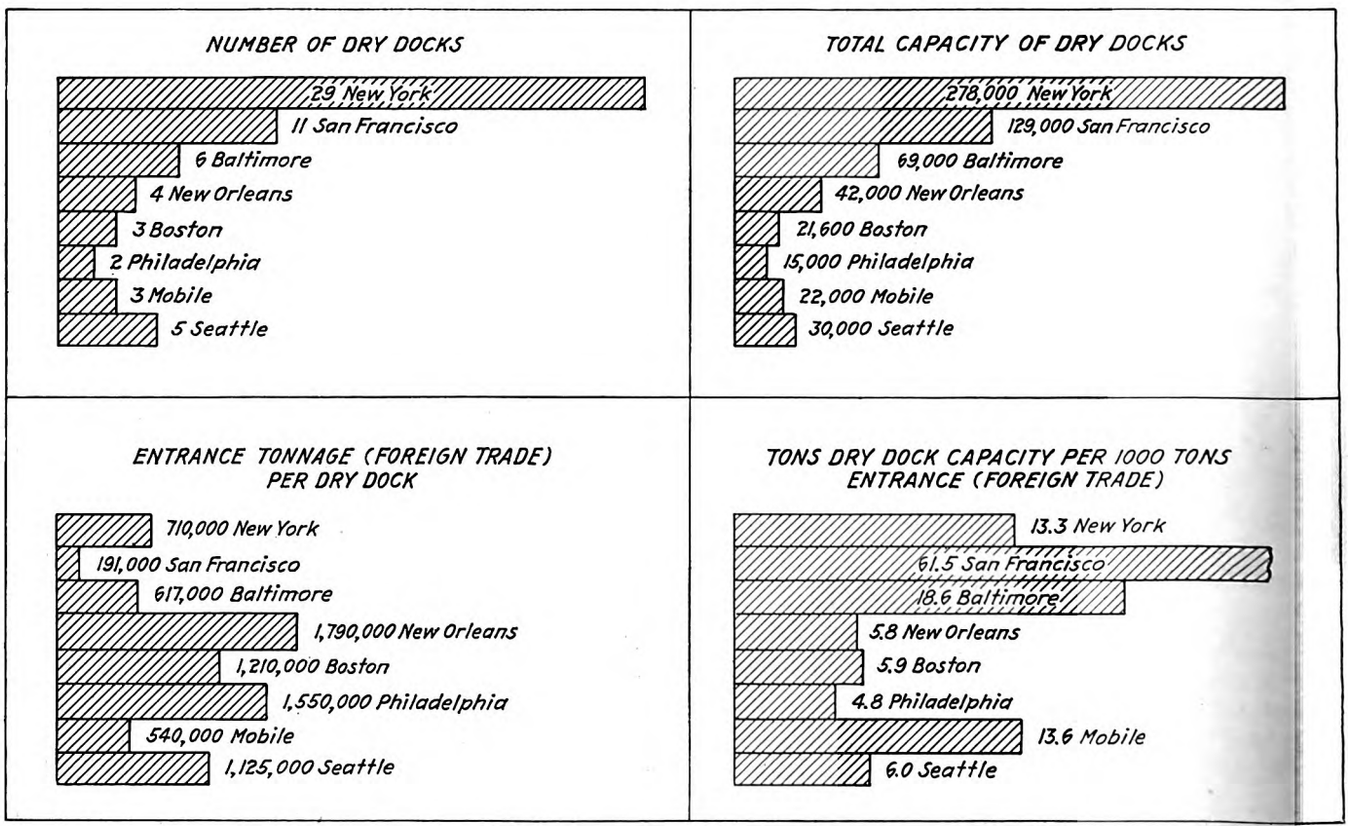
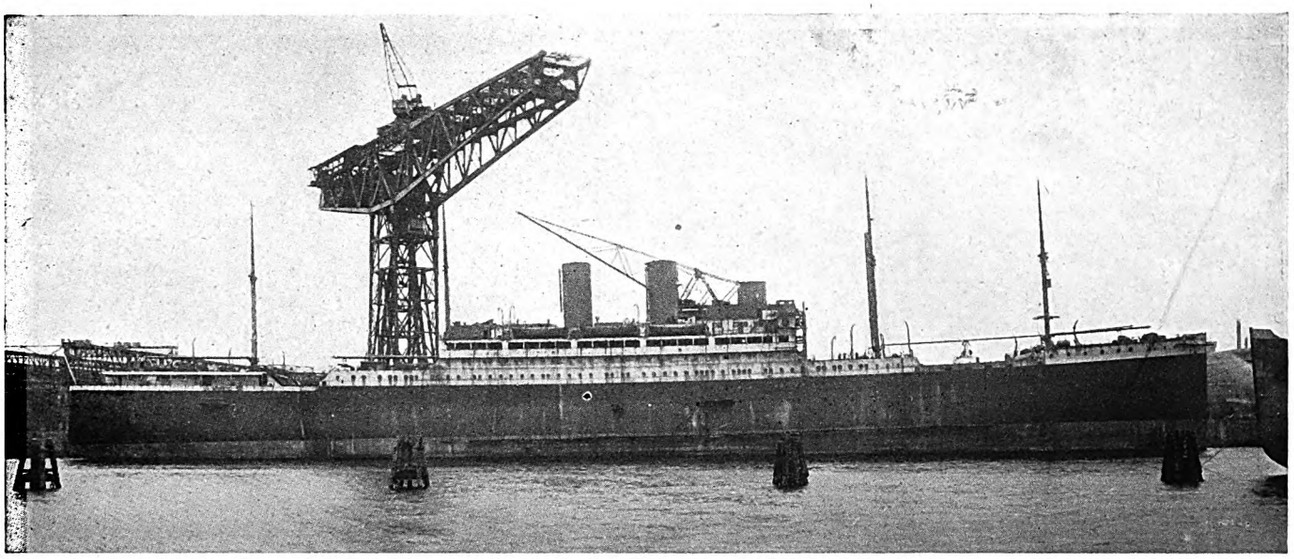



**Chart Furnished by the Crandall Engineering Company, Boston, Mass., Showing Number of Dry Docks for Ships 350 Feet Long and Over in Comparison with Entrance Tonnage as of March, 1923**

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



S. S. Albert Ballin Nearing Completion at Blohm and Voss Shipyard, Hamburg, Germany

# The Twin Screw Turbine Steamer Albert Ballin

## New Hamburg-American Liner Fitted With Stability Bulges and Anti-Rolling Tanks Placed on New York Berth

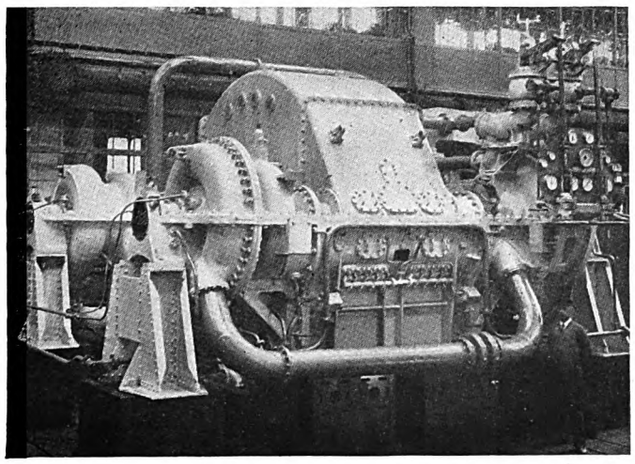
**By Dr. Ing. E. Foerster**

AFTER the great war, through which Germany lost practically its entire mercantile fleet, she has endeavored to rebuild at least those units which would enable the reorganization of some few main passenger lines crossing the North and South Atlantics.

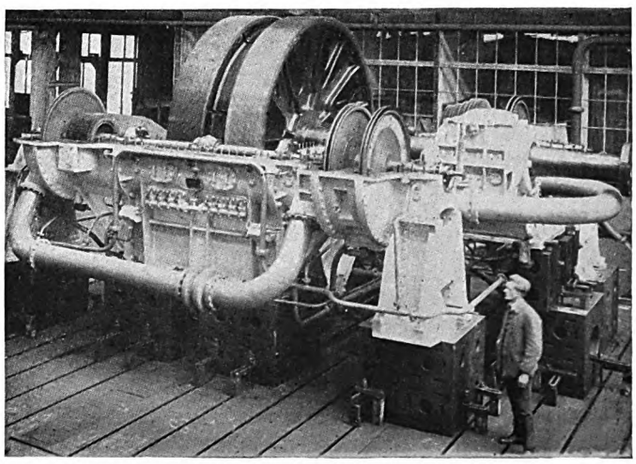
With respect to the River Plate service, the most remarkable vessel now in that trade (the 21,000-ton triple screw liner *Cap Polonio*) was rebought by their pre-war German owners, after she had been delivered to the Allies according to the treaty of Versailles. This steamer, therefore, is representing the German passenger traffic in that trade together with some smaller liners of the same company and of the Hamburg-American Line.

On the North Atlantic practically all vessels of value were transferred, by the treaty, to British and American owners, the most significant ones being the *Vaterland* (*Leviathan*) and the *Bismarck* (*Majestic*) both having been built by Blohm & Voss for the Hamburg-American Line.

With respect to passenger service, the Hamburg-American Line has reconditioned the former express liner *Deutschland* as a 17-knot freight and passenger steamer, and it has also built the *Thuringia* and *Westfalia,* all running in a special fixed agreement with the United American Lines. This latter progressive shipping concern bought from Holland the two formerly German River Plate liners *Resolute* and *Reliance* which in 1915 had been sold to the Royal Dutch Lloyd by the Hamburg-American Line. With these and other vessels the United American Lines and the Hamburg-American Line are running a regular service between the United States and Europe, the German partner aiming, however, at an improved representation in this combine, more in keeping with its traditions. The foregoing are, therefore,



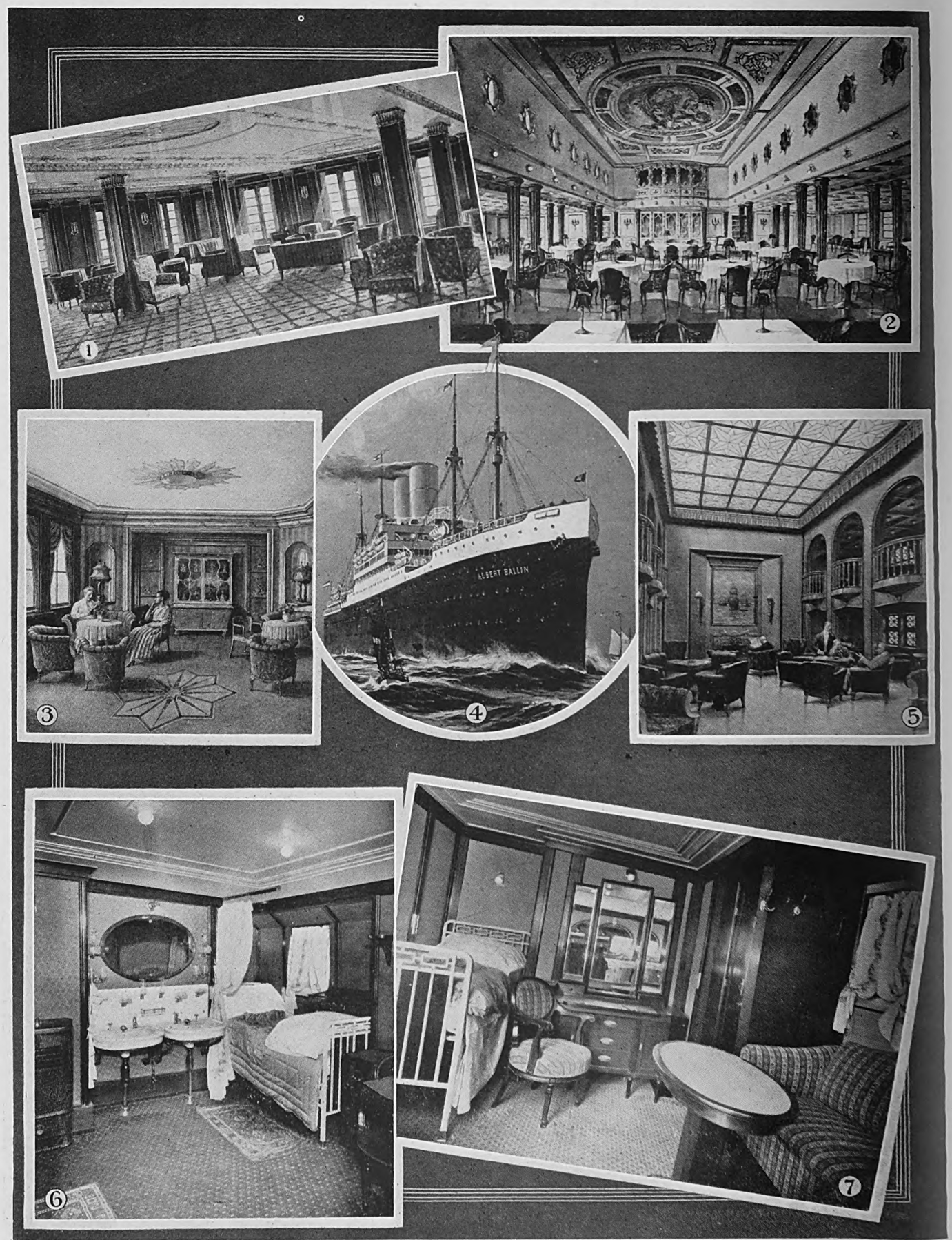
Propelling Machinery with Gear Box Closed



Starboard Propelling Unit with Upper Casing Removed

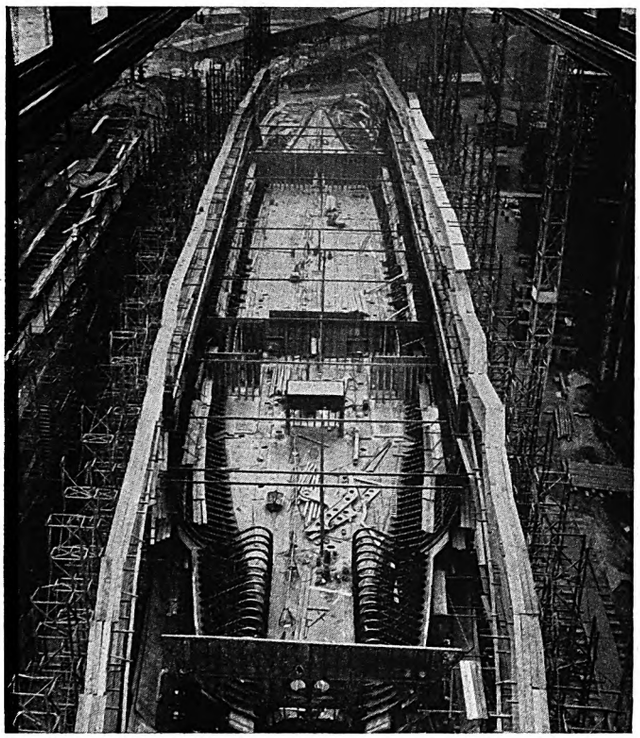


Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

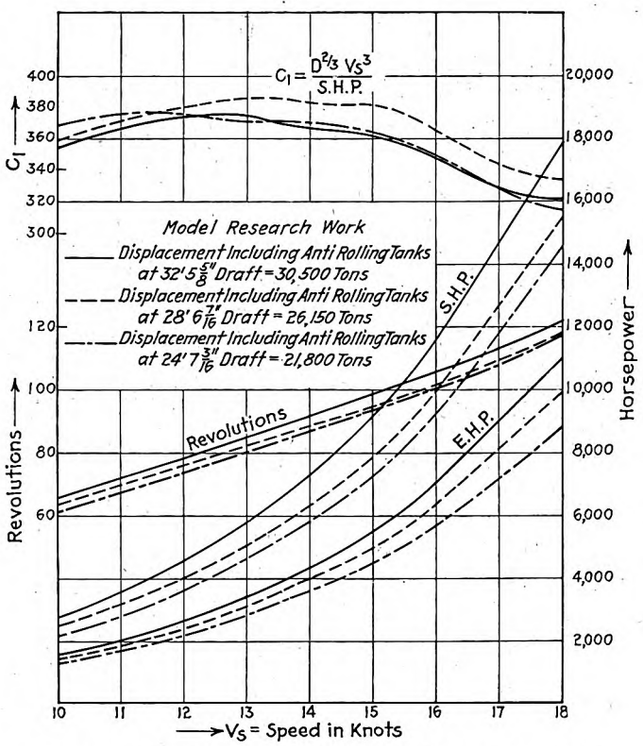



S. S. Albert Ballin: (1) Social Hall, (2) Dining Room, (3) Ladies' Lounge, (4) The Vessel in Service, (5) Smoking Room, (6) and (7) First Class Staterooms

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



View of Hull During Erection


$C_1 = \frac{D^{2/3}\ Vs^3}{S.H.P.}$
$C_1$
Model Research Work
Displacement Including Anti Rolling Tanks at 32' 5 5/8" Draft = 30,500 Tons
Displacement Including Anti Rolling Tanks at 28' 6 7/16" Draft = 26,150 Tons
Displacement Including Anti Rolling Tanks at 24' 7 3/16" Draft = 21,800 Tons
S.H.P.
E.H.P.
Revolutions
Revolutions
Horsepower
Vs = Speed in Knots

Performance Curves Based on Model Research Work

the conditions which led to the building of the new Hamburg-American liner *Albert Ballin.*

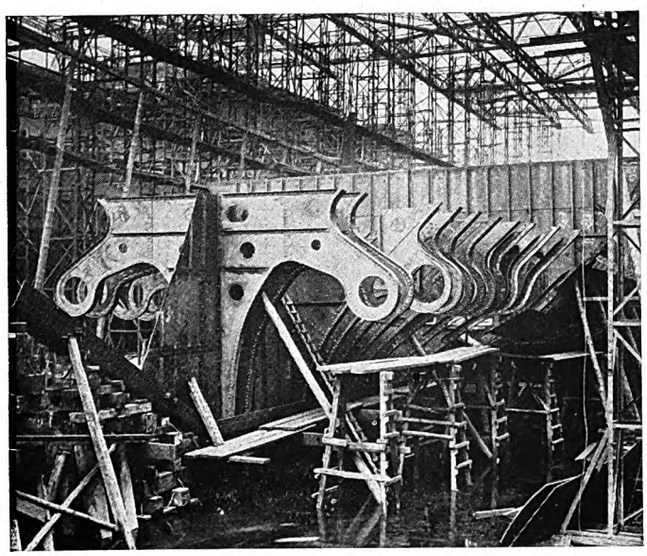
One of the most striking novelties in this new vessel is the adaption of stabilizing bulges in the waterline, a proposal of the writer, who first recommended this method of "local treatment of the question of stability" for River Plate steamers, in order to compensate by automatically increasing the stability of form for the loss of stability during the voyage, caused by the consumption of coal, oil, fuel, feed and fresh water, the maximum beam of the bulges, in this case, being in the "waterline of arrival."

In the case of the *Albert Ballin,* this principle has been adopted in order to save beam, meaning, that the beam necessary for the accommodations, was less than the beam which was necessary for stability. The latter was obtained on the principle of local bulges while the vessel's main beam (classification beam) remained on the practical basis of the lower figure. The *Cap Polonio* herself and a good deal of model tank research work in connection with the design of the *Albert Ballin* has proved the physical phenomenon, that the resistance of a given ship is, in higher speeds, diminished by adding bulges—and only very slightly, or practically not at all increased at lower speeds.

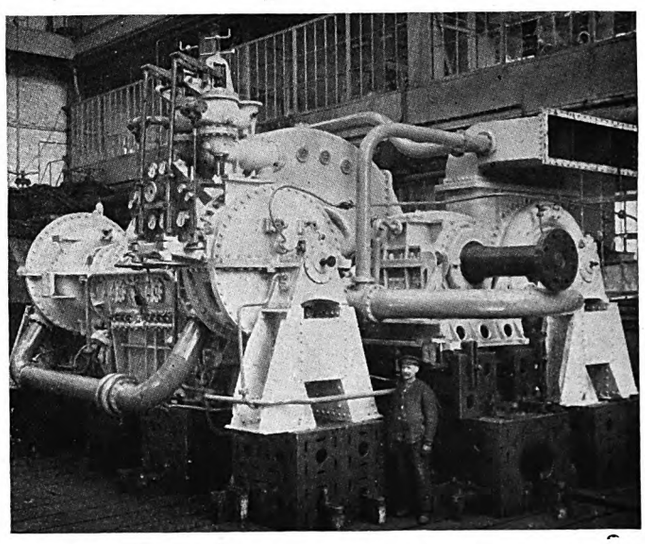
In combination with these bulges the new system of Dr. Frahm's anti-rolling tanks is adopted—a part of the bulges being used for this purpose and therefore communicating with the sea by openings in the outer hull.

The design of the superstructure is influenced by the merits of the bulges, showing a relatively high development especially of the bridge decks.

The *Albert Ballin* has been built by Blohm and Voss to the highest class of the Germanischer Lloyd of best mild

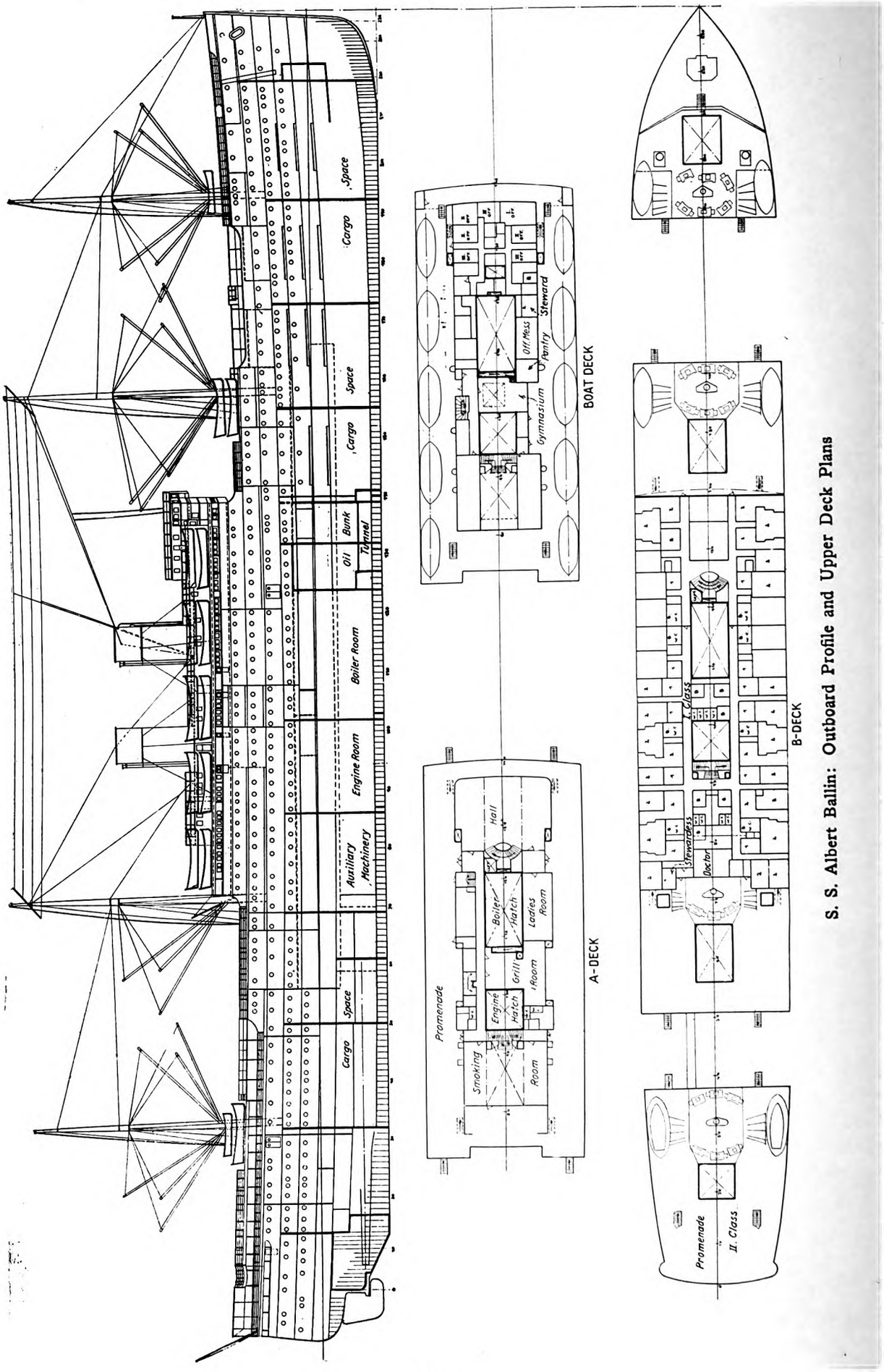


Spectacle Framing



Complete Unit of Turbines, Reduction Gears and Main Shaft

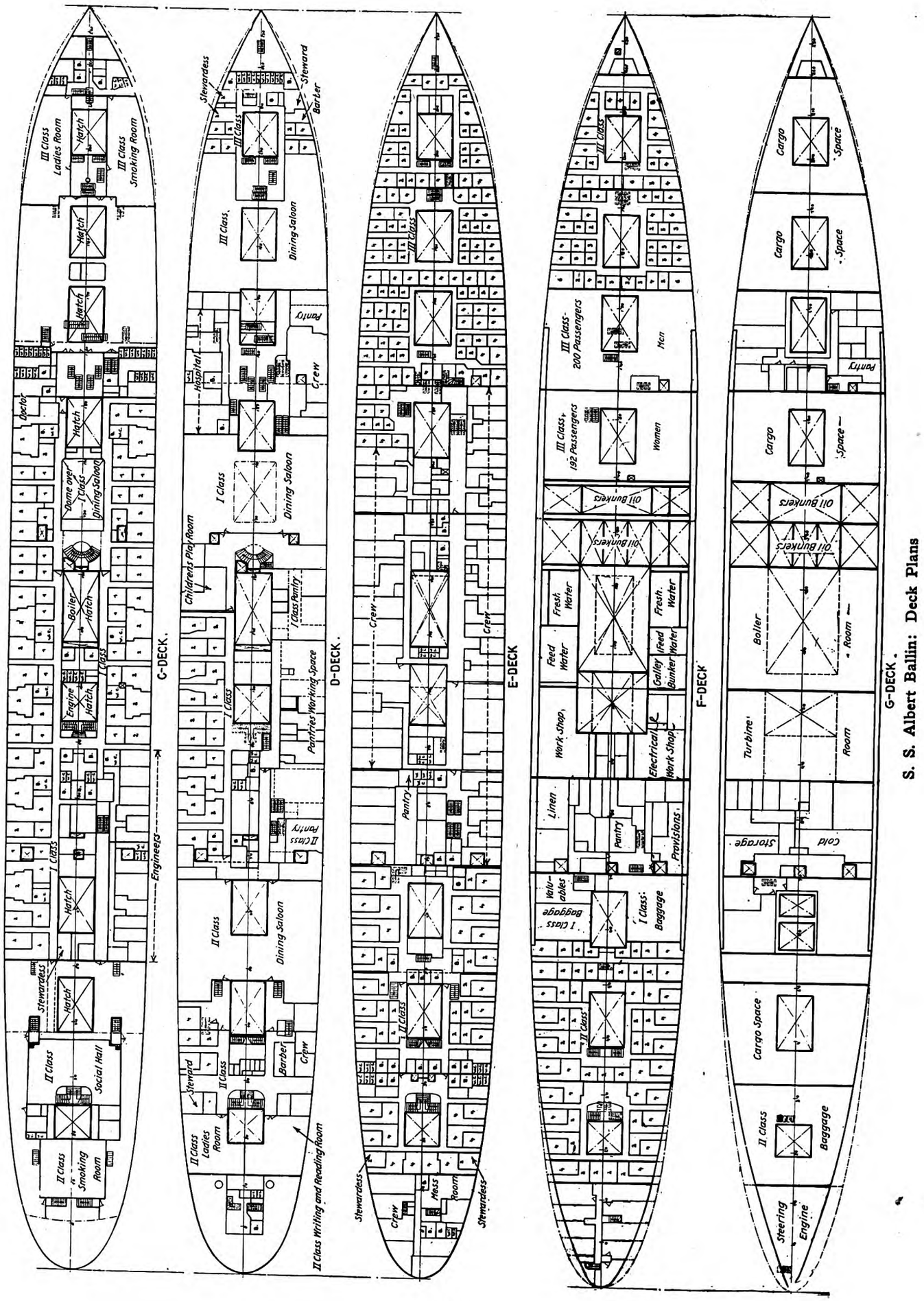
Generated on 2024-09-12 16:56 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




**S. S. Albert Ballin: Outboard Profile and Upper Deck Plans**



Generated on 2024-09-12 16:18 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




S. S. Albert Ballin: Deck Plans



Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# General Data: New German Liner Albert Ballin

## General Information

**Service:** Hamburg-New York.
**Builder:** Blohm and Voss, Hamburg.
**Owner:** Hamburg American Line.

## Characteristics

| | |
|---|---|
| Length, overall | 627′ 1⅝″ |
| Length, B. P. | 599′ 10 15/16″ |
| Breadth, molded over bulge | 78′ 8⅝″ |
| Depth, molded | 55′ 6″ |
| Draft, loaded | 32′ 7 13/16″ |
| Speed, loaded, knots | 16 |
| Framing | Deep framed |
| Class | Germanischer Lloyd |
| Deadweight capacity | 13,500 tons |

## Equipment

| | |
|---|---|
| Anchors: | |
| 3 Bower | 14,068 lbs. tot. |
| 1 Stream | 2,646 lbs. tot. |
| 1 Kedge | 1,323 lbs. tot. |
| Chain: | |
| Length | 1,968′—3 1/16 dia. |
| 1 steel hawser | 788′—7¼ circ. |
| 1 steel hawser | 788′—5⅜ circ. |
| 2 steel hawsers | 788′—2⅜ circ. |

## Complement

| | |
|---|---|
| Deck officers | 15 |
| Deck crew | 52 |
| Engineer officers | 16 |
| Engineer crew | 32 |
| Purser's and steward's department | 280 |
| Total officers and crew | 405 |
| First-class passengers | 280 |
| Second-class passengers | 340 |
| Third-class passengers | 960 |
| Total passengers | 1,580 |
| Total complement | 1,985 |

## Handling Equipment

| | No. | Type | Capacity | Length |
|---|---|---|---|---|
| Masts | 4 | — | — | 140′ |
| Booms | 23 | — | — | — |
| Discharging capacity | | | | 5 tons |

## Deck Machinery

(Number, Size, Type)

Steering gear, 1 electric driven.
Windlass, 1 steam driven.
Capstans, 2 steam driven forward, 2 electric driven aft.
Winches, 2 steam driven, 2 electric driven.
Boat winches, 2 steam driven.

## Life Saving Equipment

| Lifeboats | No. | Type | Length |
|---|---|---|---|
| Motorboats | 2 | — | 28′ |
| Lifeboats | 14 | — | 30′ |
| Lifeboats | 10 | — | 28′ |
| Lifeboats | 2 | — | 26′ |
| Working boats | 2 | — | 22′ |
| Total | 30 | | |

## Propelling Machinery

### Boilers

| | |
|---|---|
| Number | 4 double, 4 single |
| Type | Scotch |
| Length | D. E. 21′ 2¾″, S. E. 10′ 7⅛″ |
| Diameter | 15′ 3 1/16″ |
| Furnaces | D. E. 6, S. E. 3 |
| Fuel | Oil |
| Draft | Howden forced |
| Total heating surface, square feet | 32,300 |
| Total grate surface or furnace volume | 1150/1250 |
| Superheat, degrees F | 302° |
| Working pressure, lbs. per sq. in. | 213 |
| Normal fuel consumption: | |
| Per day, tons | 130 oil |
| Normal steam production: | |
| Per hour per pound of fuel | 13 lbs. |
| Total per hour | 155,000 lbs. |

### Engines

| | |
|---|---|
| Number | Two 4-stage sets |
| Type | Gear turbine |
| Horsepower | 13,000 I. H. P. |

### Propellers

| | |
|---|---|
| Number | Two |
| Type | Built up |
| Diameter | 17′ 0¾″ |
| Pitch | 17′ 0¾″ |

## Auxiliary Machinery

(Number, Size, Type)

| Machinery Space: | |
|---|---|
| Condensers | 2—Surface, 6,458 sq. ft. each |
| Evaporators | 2 |
| Distiller | 1 |
| Filters | 1 |
| Feed water heater | 1 |
| Fuel oil heaters | 4 |
| Pumps: | |
| Circulating pump | 2 |
| Steam jet pump | 4 |
| Centrifugal condensate pump | 4 |
| Simplex feed water pump | 2 |
| Centrifugal feed water pump | 2 |
| Auxiliary condensate pump | 1 |
| Ballast pump | 2 |
| Sanitary pump | 1 |
| Simplex steam pump | 1 |
| Oil feed pump | 2 |
| Simplex mud pump | 1 |
| **Refrigerating Machinery:** | |
| 1 set duplex | 200,000 cal. metric. |
| 1 set simplex | 17,500 cal. metric. |
| **Electric Equipment:** | |
| Generators, 3 sets of 220 K.W. | |
| Radio, 1 main, 1 spare station. | |
| Emergency, 2 sets of 25 K.W. | |

## Holds

| No. | Length | Hatches |
|---|---|---|
| 1 | 56′ | 22′ x 18′ |
| 2 | 47′ 6″ | 25′ x 18′ |
| 3 | 49′ | 27′ x 18′ |
| 4 | 44′ | 24′ 6″ x 18′ |
| 5 | 30′ | 27′ x 18′ |
| 6 | 49′ | 27′ x 18′ |
| 7 | 49′ 6″ | 16′ x 18′ |

## Capacities

### Cargo Space

| Compartment: | Cub. Ft. Grain | Cub. Ft. Bales |
|---|---|---|
| Hold No. 1 | 42,031 | 35,850 |
| Hold No. 2 | 56,547 | 51,602 |
| Hold No. 3 | 65,590 | 60,150 |
| Hold No. 4 | 57,006 | 52,308 |
| Hold No. 5 | 30,269 | 26,878 |
| Hold No. 6 | 40,265 | 36,697 |
| Hold No. 7 | 29,422 | 26,595 |
| 2nd 'tween deck No. 1 | 19,072 | 16,706 |
| 2nd 'tween deck No. 2 | 25,182 | 22,322 |
| 2nd 'tween deck No. 4 | 25,818 | 22,569 |
| 2nd 'tween deck No. 6 | 41,288 | 38,253 |
| 1st 'tween deck No. 3 | 24,796 | 24,795 |
| 1st 'tween deck No. 4 | 33,074 | 35,250 |

### Refrigerated Space

| Compartment: | Cu. Ft. |
|---|---|
| Cargo | 16,531 |
| Ice | 1,236 |
| Beer | 2,578 |
| Cheese, eggs, butter | 1,766 |
| Ham | 424 |
| Meat | 3,602 |
| Fish | 635 |
| Poultry | 883 |
| Vegetables | 3,038 |

### Fuel Oil Bunkers

| Compartment: | Cu. Ft. |
|---|---|
| Cross bunkers | 96,350 |
| Coal bunker for galleys | 3,420 |

### Double Bottom Tanks

| Compartment: | Cu. Ft. Fuel Oil |
|---|---|
| No. 1 | 5,355 |
| No. 2 | 6,910 |
| No. 3 | 9,650 |
| No. 4 | 9,305 |
| No. 5 | 5,510 |
| No. 6 | 19,700 |
| No. 7 | 9,280 |
| No. 8 | 11,660 |
| No. 9 | 9,395 |
| No. 10 | 4,445 |
| Total | 91,210 |

### Peak Tanks and Deep Tanks

| | |
|---|---|
| Fore peak | 5,690 Cu. Ft. S. W. |
| Aft peak | 8,050 Cu. Ft. S. W. |
| Deep tanks on d. b. | 25,730 Cu. Ft. F. W. |
| Deep tanks on tw. deck | 12,500 Cu. Ft. F. W. |

---

Siemens Martin steel, and conforms to all the rules prescribed by the American, British and German laws for this class and type of vessels, carrying passengers of three classes including emigrants.

With respect to safety appliances, including bulkheads and boats, the vessel is built and equipped according to the rules and recommendations laid down as a result of the *Titanic* conference for the protection of human life at sea.

### Principal Dimensions

| | |
|---|---|
| Length over all | 627 feet 1⅝ inches |
| Length between perpendiculars | 599 feet 10 15/16 inches |
| Beam over inner frames | 72 feet 9 inches |
| Beam over frames of bulges | 78 feet 8⅝ inches |
| Depth molded to first deck | 55 feet 6 inches |
| Maximum draft | 32 feet 7 13/16 inches |
| Carrying capacity, deadweight | 12,796 Eng. Tons |
| Engine power | 13,000 I. H. P. |
| Designed average speed | 16 knots |

The double bottom, representing a space of 2,300 tons, is used for fresh feed and ballast water in the usual way and for only 600 tons of spare oil fuel, the latter being principally carried in deep tanks above the tank top.

Outside of the double bottom feed and fresh water tanks of 1,000 tons capacity are provided.

The bunkers for oil fuel were carefully designed to prevent leakages by deformation, caused by the bending stresses imposed by the waves. They have a net capacity for 2,730 tons of oil.

The cargo space contains 449,975 cubic feet measured to the lower edge of beams, the inner edge of frames and the tank top ceiling. In this figure, the refrigerated spaces of 3,038 cubic feet and miscellaneous spaces for provisions, paint, etc., of 3,815 cubic feet are not included. The plans show the general distribution of the space.

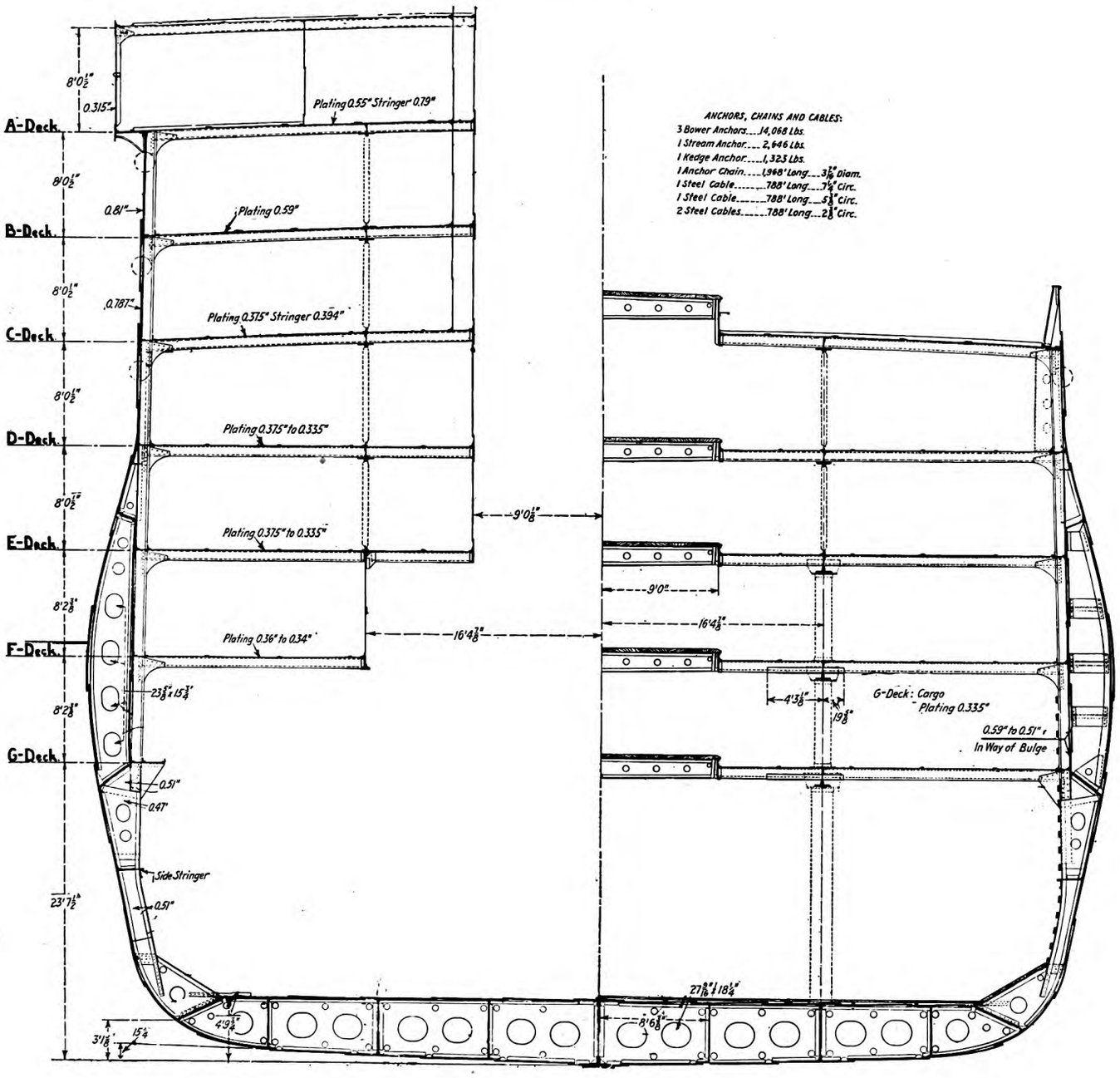
### Passenger Accommodations

Amidships the vessel is arranged for the accommodation of the first class passengers. The second and third classes are distributed in the ends of the vessel as shown on the plans.

The total number of passengers that can be accommodated is as follows: First class, 127 cabins with 215 normal berths, 36 sofa-berths, 23 spare berths; second class, 108 cabins with 216 normal berths, 124 sofa-berths; third class, 186 cabins with 645 normal berths, 315 berths in compartments.

The first class has a dining saloon with 238 seats, a hall with 64 seats, ladies' saloon with 29 seats, smoking saloon with 100 seats, grill room with 36 seats, children's playroom with 22 seats, two deck-verandahs with 98 seats.

Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




**S. S. Albert Ballin: Midship Section**

The second class has a dining saloon with 214 seats, a hall with 65 seats, smoking saloon with 72 seats, ladies' saloon with 76 seats and a deck-verandah.

The third class has a dining saloon with 345 seats, smoking saloon with 70 seats and ladies' saloon with 70 seats.

### Steering and Navigating Appliances

The partly balanced rudder has been designed as a one plate rudder supported by welded arms. The rudder quadrant is installed on *G* deck. The steering engine is electrically driven. Two equal units are provided, one of them performing the service, the other being in reserve.

The Anschütz gyroscope compass combined with the self-steerer has been installed, enabling the vessel to be steered on a given course by the compass without a helmsman. This new principle, one of the most sensational inventions in shipping, is based upon the automatic work of a small motor in the compass box, which is controlled by the compass—this latter making the contacts for the working of the motor in the one or the other direction. This motor is connected to the axis of the hand wheel of the telemotor by a Gall chain. The vessel has powerful submarine signalling and wireless installations, whose power is secured by an emergency motor generator in case of damage to the main engine or boiler plant.

There are four vertical steel masts and seven hatches, worked by twenty-one 5-ton Mannesmann-derricks and twenty-one steam winches. The provision hatches are worked by electric winches.

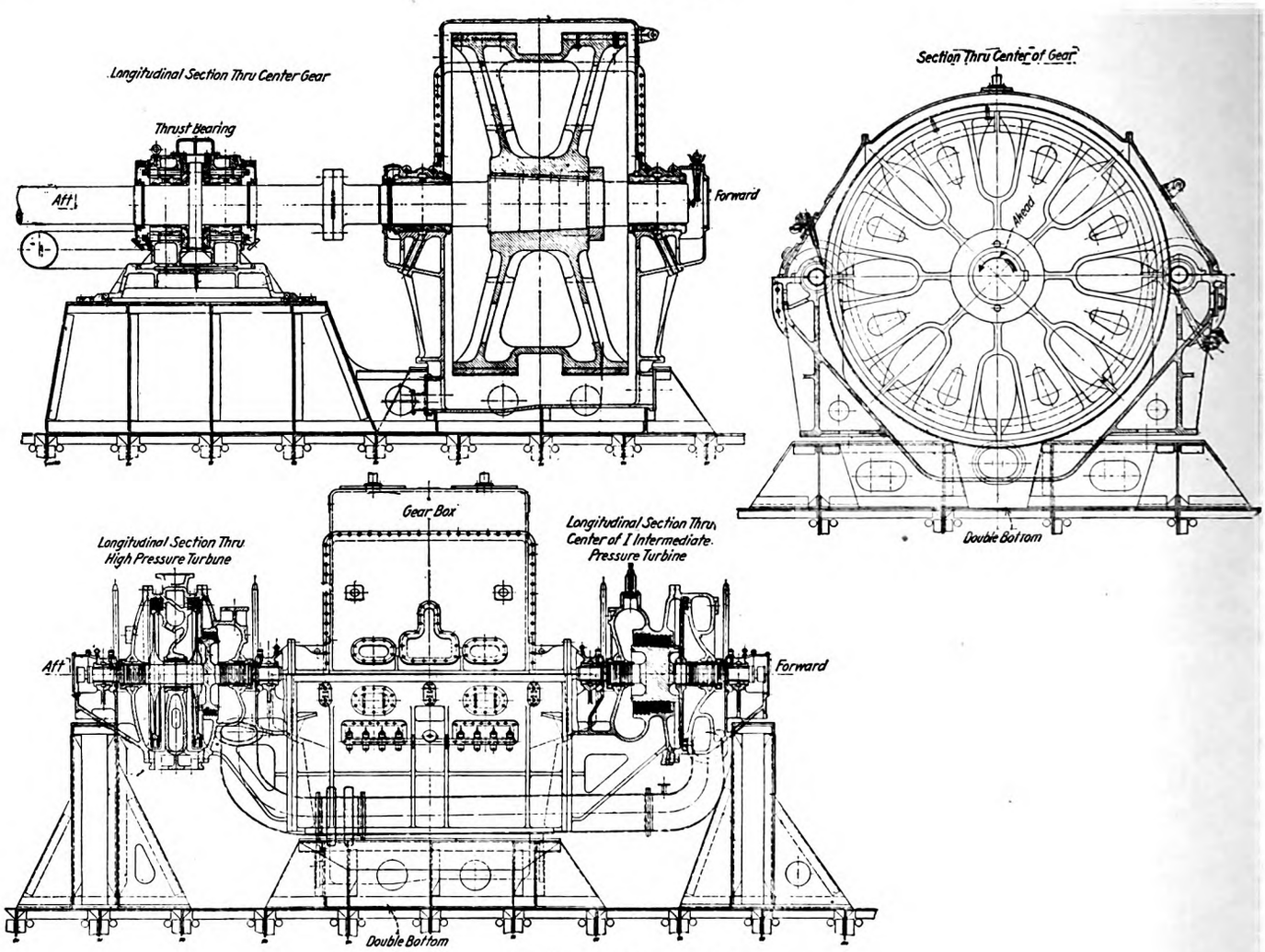
### Appliances for Safety and Life Saving

The vessel has 13 watertight bulkheads, which have no interruption whatever from the tank top up to the bulkhead deck.

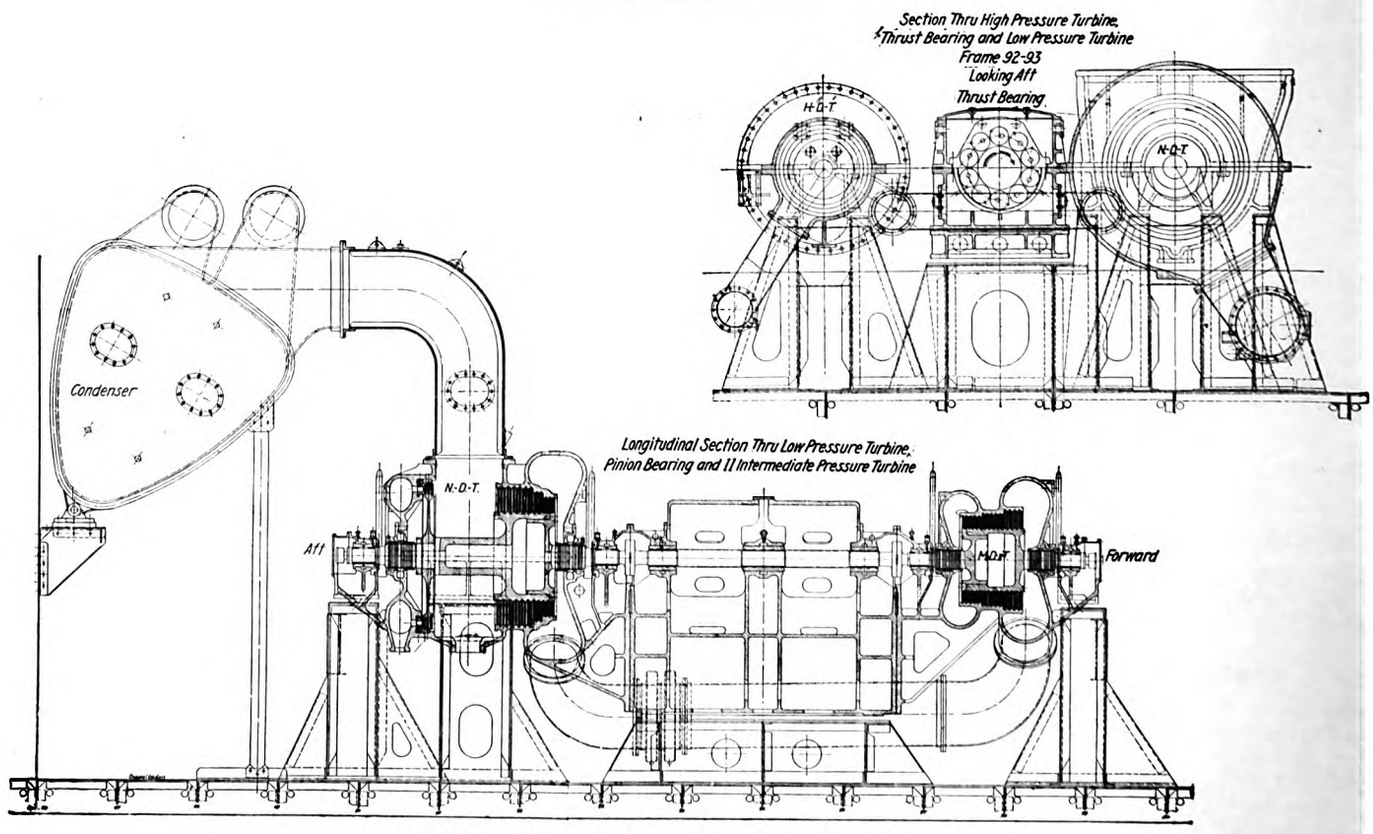
The double bottom is raised at the sides in order better to cover the bilges.

The necessary openings in the bulkheads in the range of the engine and boiler plant are worked by an elaborate

Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

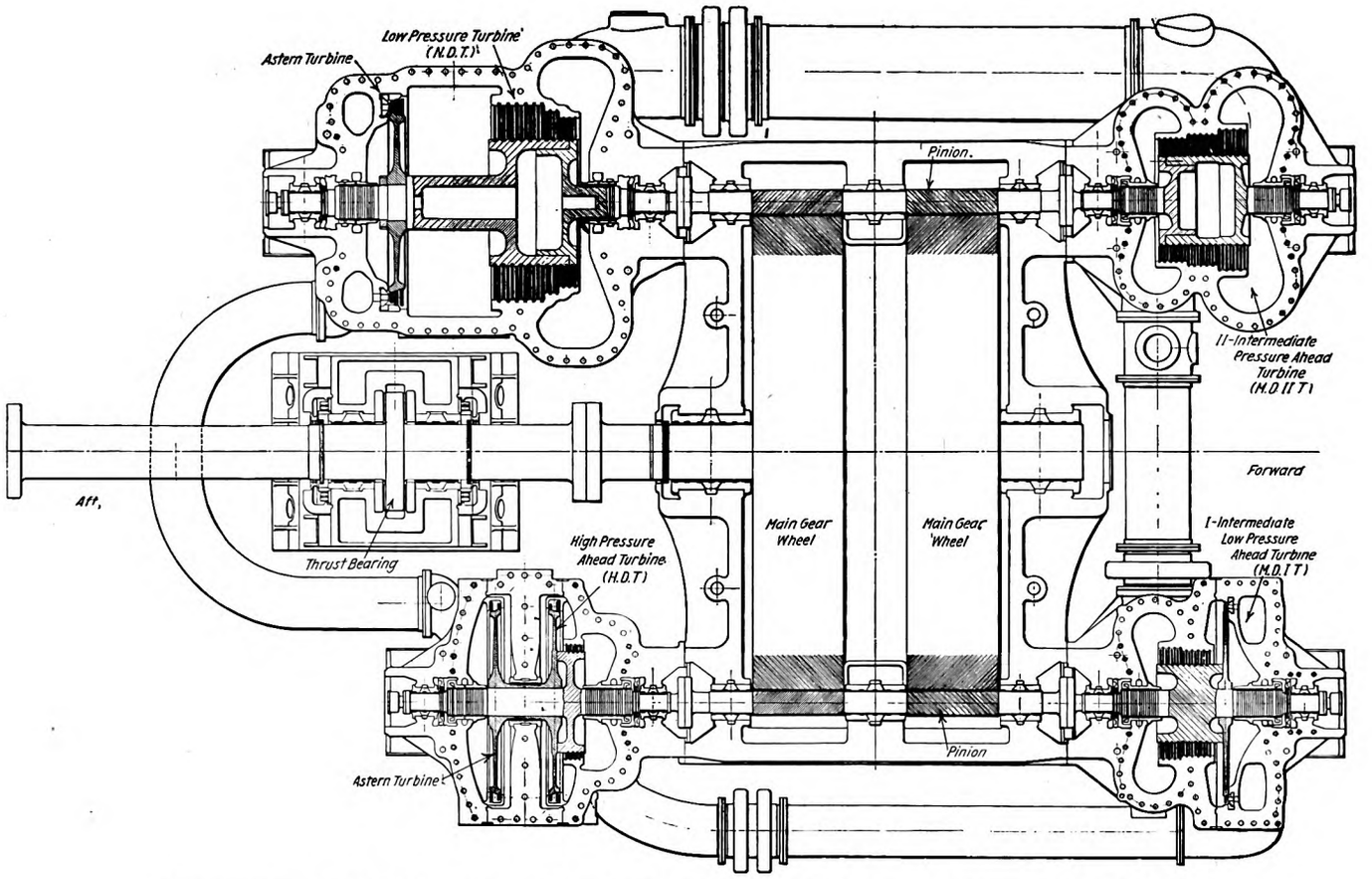



Details of Reduction Gear




Sections Through One of the Propelling Units

Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




**Arrangement of Port Set of Four Ahead and Two Astern Turbines. Starboard Side Similar**

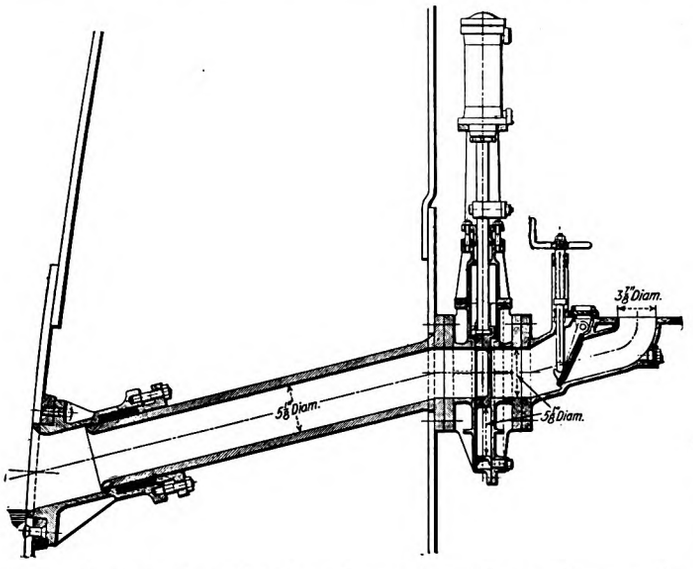
hydraulic-pneumatic system developed and executed by the Atlas Works.

A further remarkable safety feature is the hydraulic-pneumatic system for closing the main scuppers after a collision, as these come below the water level. The illustration of this arrangement shows the principle of this important addition to safety, which excludes any water that may run into the vessel through scuppers below the bulkhead deck.

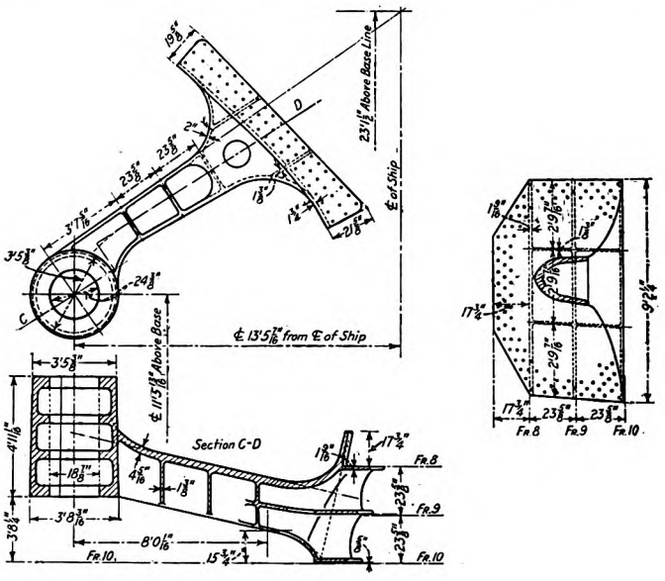
The number and size of lifeboats have been adjusted to the maximum number of passengers and crew on board. All boats are placed under Welin quadrant davits. There are 28 normal lifeboats, diagonally built of oak, two of them being motorboats.

## THE MAIN ENGINES

The main engines are two turbine plants of equal size, independent of each other but symmetrically arranged. Each set consists of four ahead turbines, and two astern turbines, driving one propeller by means of a single reduction gear through one large wheel gearing with two small pinions. The ahead turbine sets are composed of four cylinders. The pinion placed amidship is set in motion at its aft end by




**New System Installed for Preventing Water Coming in Through Toilets and Washrooms In Case Vessel Sinks to Deeper Draft After Collision**

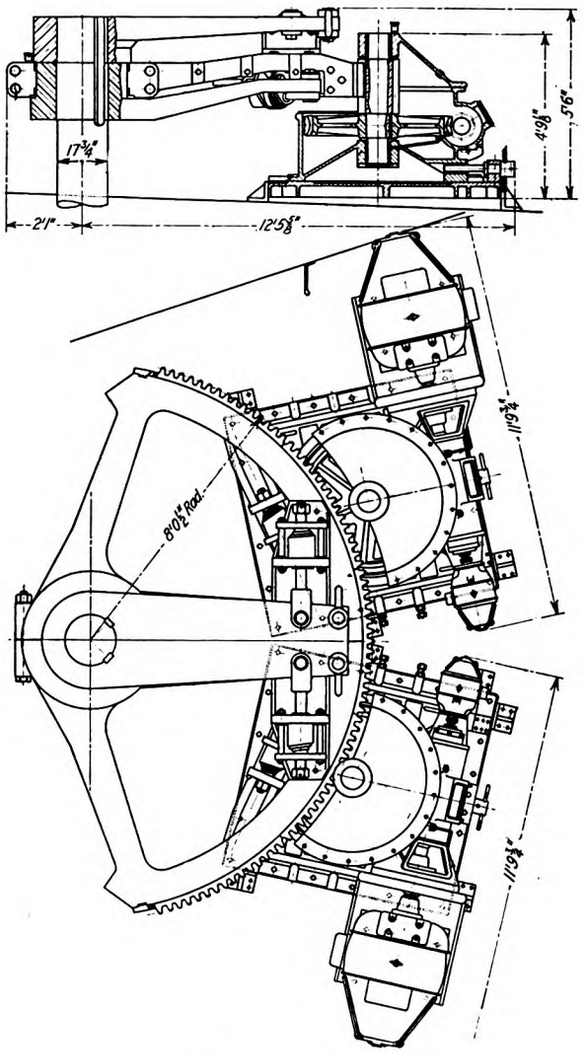



**Shaft Strut**

Generated on 2024-09-12 16:18 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

the high pressure turbine, H.D.T. and at its forward end by the first intermediate pressure turbine M.D.I.T. The pinion next to the ship side, at its fore end by the second intermediate pressure turbine M.D.II.T. and at its aft end by the low pressure turbine N.D.T.

The principal advantage of this arrangement consists in subjecting the pinion to equal torsional strain from either side, to prevent a twisting inside the length of the pinion and to warrant an equal pressure on the tooth face. Further, this arrangement of the turbines avoids axial-thrust and balance-pistons inside the turbines. Therefore no thrust




**Steering Gear**

bearings are provided, as the gearing itself, being right-handed and left-handed, fixes the position of the entire shaft.

The division of the turbine in four stages affords a very high steam efficiency, in spite of the relatively slow running turbines. Therefore a single reduction gear of 1:20 is sufficient to bring down the revolutions of the propeller to 110 per minute. By this system of gearing the difficult problem of combining turbine plant of high economy and small weight with an efficient propeller of low peripheral velocity has been solved.

By dividing the turbine, the heat stresses are reduced to a minimum, allowing tightness of flanges, dummy-rings and stuffing-boxes, which are of extraordinary small size, compared with the power developed. Better reliability and an easy overhaul of the plant are further advantages obtained. The high pressure turbine H.D.T. and the first medium pressure turbine M.D.I.T. consists of action and reaction parts, the second medium pressure turbine M.D.II.T. and the low pressure turbine N.D.T. are of pure reaction type.

The total power of the two turbine sets is 12,000 effective horsepower at about 2,100 revolutions. The astern turbines develop two-thirds of this amount, corresponding to the lower efficiency of the propeller blades.

Running astern, the inner pinion is driven by the high-pressure astern turbine H.D.R.T., the outer pinion by the low pressure astern turbine N.D.R.T., placed at the aft end of the pinion shafts. Both astern turbines are in the same casings as the corresponding ahead turbines. To avoid axial thrust of the astern turbines, they are designed as pure action-wheels with two rows of blades.

The two pinions of equal size engage with the large wheel, transferring the power to the propeller by the tunnel shafting. The propeller thrust is taken up by Michell thrust blocks, fastened to strong frames and foundations. The thrust block consists of a single thrust ring on the thrust shaft and the movable pads, 10 for going ahead and 10 for astern, each pad being adjustable by a separate set screw.

## PROPELLERS

The two built-up propellers of 17 feet 0¾-inch diameter and 17 feet 0¾-inch pitch are composed of four bronze blades and cast iron bosses fitted with steel junk-rings. The two stern tubes are lined in the usual manner with lignum vitæ bushes.

The shafting is supported by 16 bearings, automatically lubricated by an oil circulating system. A thorough and copious supply of lubricating oil is essential for good working of the turbines. One duplex steam pump brings the oil up through a strainer to an elevated tank. From there it is distributed to all oil supplies, and flows back into a tank in the double bottom. Therefore all turbine, gear and thrust block bearings are supplied with oil of constant and uniform pressure. The gear's teeth get the oil over the whole width by distributing jets. The flow of oil and its temperature are under permanent control. To warrant sufficient lubrication of the whole plant before starting, an automatic valve is provided to shut off the main steam pipe, only allowing the steam to pass, when full oil pressure has been reached. It is designed as a double beat valve to be closed by a spring and counter-balanced by a piston, lifted by the pressure in the oil supply pipe. Should this pressure be diminished by any reason, the spring shuts the valve, cutting off the steam from the turbine.

In a similar way an explosion of the turbine-wheels, caused by a broken pinion shaft, is prevented by an emergency governor, placed at the end of each turbine shaft and set to act at a certain number of revolutions.

The ends of the turbines are made steam and air tight by labyrinth packings, consisting of solid dummy rings of soft metal, fastened in the stuffing box gland and the turbine spindle.

Running the plant ahead or astern, the stuffing boxes must be tight against pressures higher or lower than the atmosphere. Thus, in the first case, the escaping steam is led to the condenser by a suction pipe, while in case of vacuum, throttled steam may enter the stuffing box, preventing air leakage to the turbine.

The whole turbine set is controlled by two hand wheels, arranged on one table near the maneuvering platform together with revolution counters and manometers.

Special lifting arrangements, consisting of trolleys and pulley blocks are provided, affording an easy and accurate means of lifting and dismounting of casings and drums when required.

In order to obtain the shortest possible piping leads, the pumps and auxiliaries for engine and ship's service are placed together in groups. There are seven groups of machinery:

Generated on 2024-09-12 16:45 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

1. Condensing plant under the condensers at the aft engine room bulkhead.
2. Boiler feed plant at the forward engine room bulkhead between main engine plant and boiler room.
3. Pumps and apparatus for ship's service on either side of the engine room.
4. Refrigerating plant at the forward end of the tunnel next to the refrigerating rooms.
5. Appliances for fuel oil service at the forward boiler room bulkhead.
6. Electrical plant above the condensers.
7. Tanks and distribution boxes and branches in the engine room hatch and dummy funnel.

### CONDENSERS

The aft condensers of pear-shaped section with a cooling surface of 6,458 square feet each, are placed athwartships, supported by the aft bulkhead of the engine room. The condenser tubes are of brass with an external diameter of ¾ inch and a thickness of 0.059 inch, the upper rows having a thickness of 0.079 inch.

Two circulating pumps with a capacity of 2,400 tons per hour at 250 revolutions per minute get their water from either side. The sea valves are fitted to the ship side close to the pumps, the cooling water pipes, therefore, are extremely short and handy. The cooling water is discharged above the condensers so that they will always be filled with water.

The air and condensate pumps are put underneath the condensers, in order to have short connecting piping.

Instead of the usual piston pumps for drawing off both air and water, the condensing plant is fitted with steam jet air pumps and centrifugal condensate pumps. This kind of condenser auxiliaries began to replace the piston pumps on board turbine ships during the past few years on account of the excellent results obtainable from steam jet air pumps on shore. On board of all ships, fitted with such pumps, all due expectations have been realized.

The steam jet air pumps are of the two stage type in combination with an intermediate condenser for condensing the working steam of the first stage, the second stage having only to draw off pure air. The exhaust steam of the second stage is condensed by a similar surface condenser. The condensate of the main condenser acts in both as cooling water, absorbing the latent heat of all the live steam. Only this new construction makes the system reliable and economical.

For each of the two condensers, there is installed a steam jet air pump having a steam consumption of 1,367 pounds per hour and, as spare, with a second one of 683.5 pounds per hour. Both pumps are fastened upon the intermediate condenser, and designed for a normal working pressure of 118 pounds per square inch, the large pump being able to draw off 103.6 pounds of air at 95 percent vacuum.

To allow sufficient low suction, a vertical design of centrifugal condensate pump was decided upon. The shaft is driven by a steam turbine, designed as an action turbine with two velocity stages. The rotor is fastened at the upper end of the shaft and the impeller of the centrifugal pump at the lower end. Both wheels are of the overhung type.

### PUMP DATA

| | |
|---|---|
| Capacity | 64.4 tons per hour |
| Manometric head (including vacuum head) | 75.5 feet |
| Revolutions per minute | 250 |
| Power absorbed | 11 horsepower |

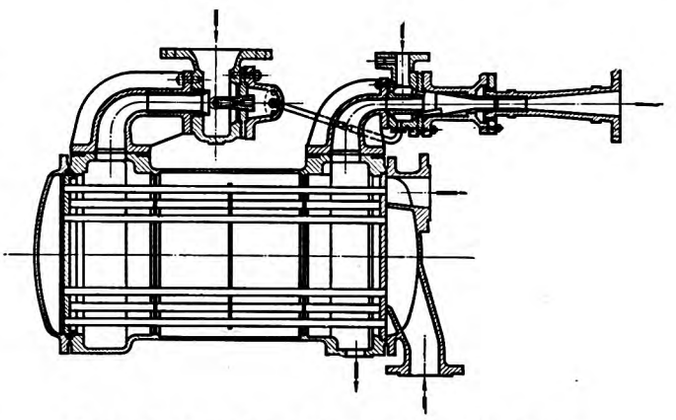
### TURBINES

| | |
|---|---|
| Normal power | 13 horsepower |
| Steam pressure | 220.5 pounds per square inch |
| Temperature of steam | 432 degrees F. |
| Back pressure | 29.4 pounds per square inch |

The condensate out of the main condensers is pumped into an elevated hot well fixed to the forward engine room bulkhead. From there, the feed water flows down to the feed pumps.

### FEED PUMPS

Two simplex pumps, constructed by Georg Niemeyer, Harburg-Elbe, and two turbine centrifugal pumps, by the A. E. G., Berlin, feed the boilers. To aid the suction to the centrifugal pumps, the feed water tank has been elevated. The shaft of the pump is supported by two oil ring bearings, the rotor of the turbine being fixed to the middle and the impeller on one end. The turbine casing and bearings are horizontally divided, giving easy access to the inner parts of the turbine and the bearings, after lifting the cylinder cover and bearing caps. The pedestals and lower parts of the casing are a solid casting, one end being flanged for fastening the pumps. The steam chest, with the by-pass valves, the nozzle block and the distributor are fastened to the turbine cover. The inlet connecting branch supports, the stop and throttle valve are combined in one casing. The first, being formed as safety shut off valve, may be closed by hand or governor. It is automatically put in action to prevent racing of the turbine when a pipe fracture occurs. The throttle valve, being controlled by regulating apparatus,



**Steam Injector Pump for Auxiliary Condenser**

regulates the output of the pump, corresponding to the necessary amount of water, by adapting the steam admission of the turbine to the pump's want of power. The suction pipe is flanged to an axial inlet connecting branch, while the tangential pressure connecting branch joins horizontally.

The turbine is constructed as a one stage action turbine, partially admissioned, with three velocity stages. It is fitted with nozzles, to be run as a non-condensing engine.

A feed water heater of 753 square feet heating surface raises the feed water temperature to 248 degrees Fahrenheit.

The auxiliary condensing plant is installed at the port side of the engine room. It consists of one circular shaped auxiliary condenser with 753 square feet of condensing surface, one simplex air pump and one circulating pump. The auxiliary condenser takes up the exhaust steam of the auxiliary engine, turbo generator, refrigerating machinery, winches, heating piping and galley apparatus. Several pumps for ship's service are installed at the same side of engine room.

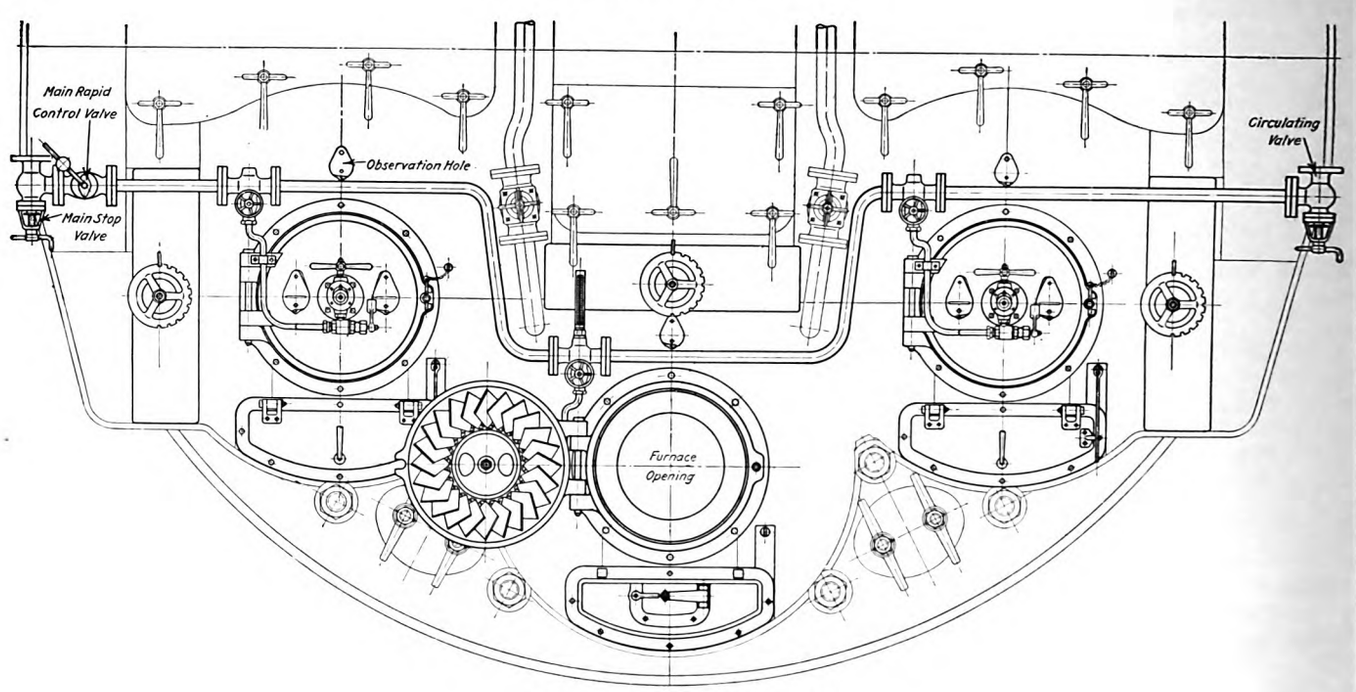
### EVAPORATOR

At the starboard side of the engine room, there is arranged a vacuum exhaust steam evaporator.

Other auxiliaries in the engine room comprise pumps and apparatus for oil service of the main turbines, for double bottom and bilge service, water supply to passenger accommodation and galleys.

The refrigerating plant is placed aft of the engine room

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




**Arrangement of Oil Burners**

and is composed of one double acting engine with a capacity of 200,000 kilogram-calories and a small one of 17,500, together with the necessary apparatus. Besides there are installed pumps and tanks for operating the watertight doors, an interesting innovation being the vertical differential pressure pump. Further aft, two sand filters and two simplex drinking water pumps are arranged.

### Boiler Plant

The boiler plant consists of four single ended and four double ended Scotch boilers, fitted with steam superheaters, the heating surface of the boilers amounting to 32,300 square feet. The single ended boiler has three and the double ended boiler, six furnaces of the Morison type, of about 3 feet 9⅜ inches diameter, the working pressure being 213 pounds per square inch. The superheaters, constructed as return pipes inside the smoke tubes, raise the steam temperature up to 662 degrees Fahrenheit. The uptakes of all boilers join together in one funnel.

Two fans, driven by steam engines and producing compressed air for the furnaces, are put above the bulkhead between the engine and boiler rooms, in order to draw off the hot air rising from valves, pipings and fittings on the bulkhead.

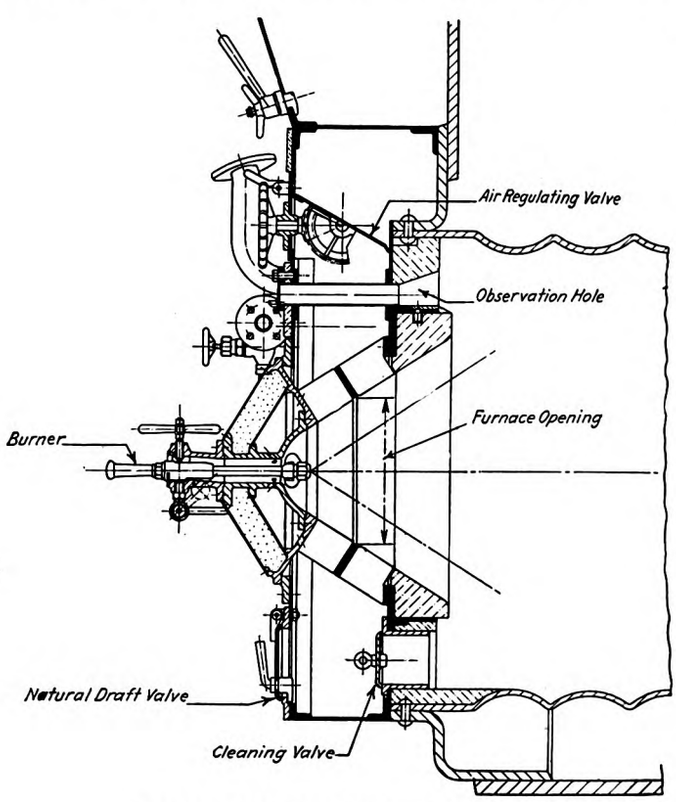
It may be mentioned that small steam turbines, to be started from the working passage, are provided for shutting off the boiler main stop valves in case of necessity.

The boilers are fitted with the Blohm & Voss oil burning system which affords economical and efficient combustion. The oil, atomized by the burners, goes into the furnace in the form of a conical spray. The burners are surrounded by a double ring of guide blades, in order to direct the air, coming from the blowing engine, tangentially into the oil cone, thus causing a quick rotating flame. By this method a perfect mixing of oxygen and oil particles is performed, producing ideal combustion, and at the same time preventing local superheating of the furnace.

The air blades are of different design, the first ring guiding the air to the outer zone of the oil cone, the second ring of blades being directed nearer to the cone's axis. Thus, even at the highest burner capacity of 529 pounds per hour, no unburnt oil particles will hit the furnace wall. Therefore, settling of coke inside the furnace, the principal drawback of many oil burning systems, is prevented, the boiler plant being adapted for the most trying conditions of oil quality and service.

In order to give an easy access to the furnaces and furnace chambers, it is possible to swing out the inner blade ring.

To prevent unequal heating or cooling of the furnace, inside brickwork is avoided everywhere.

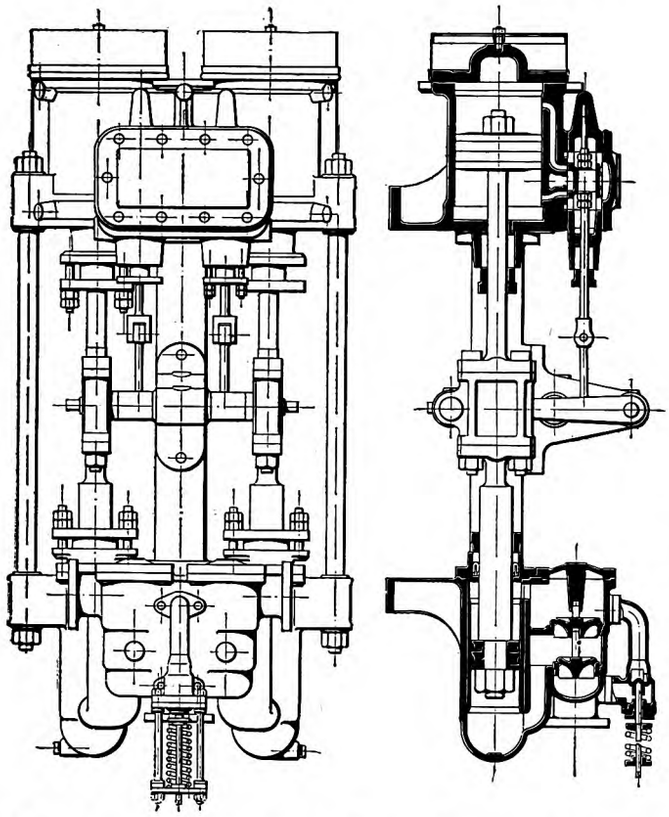



**Section Through Oil Burning Furnace**

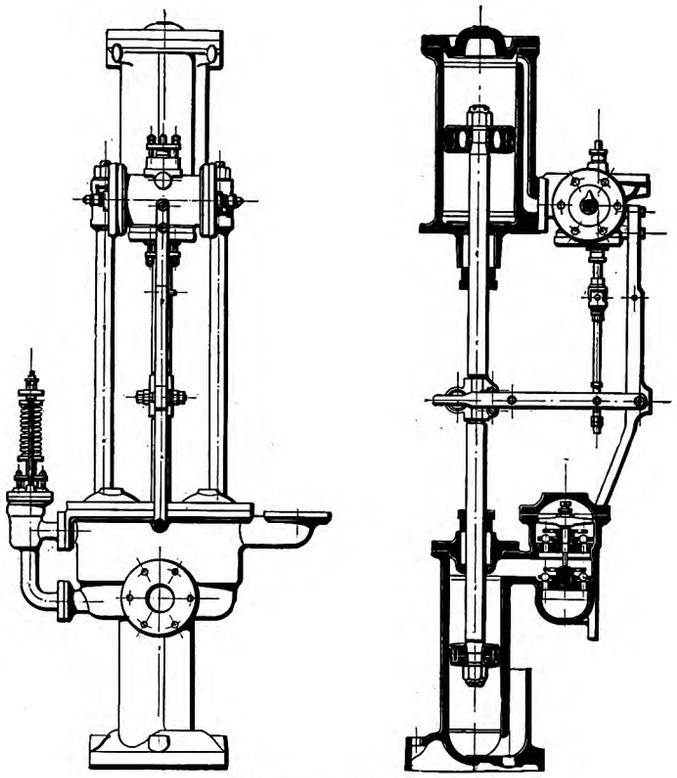
### Oil Bunkering System

To take oil on board, two filling stations with filters and control tanks have been installed. The oil flows from there

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



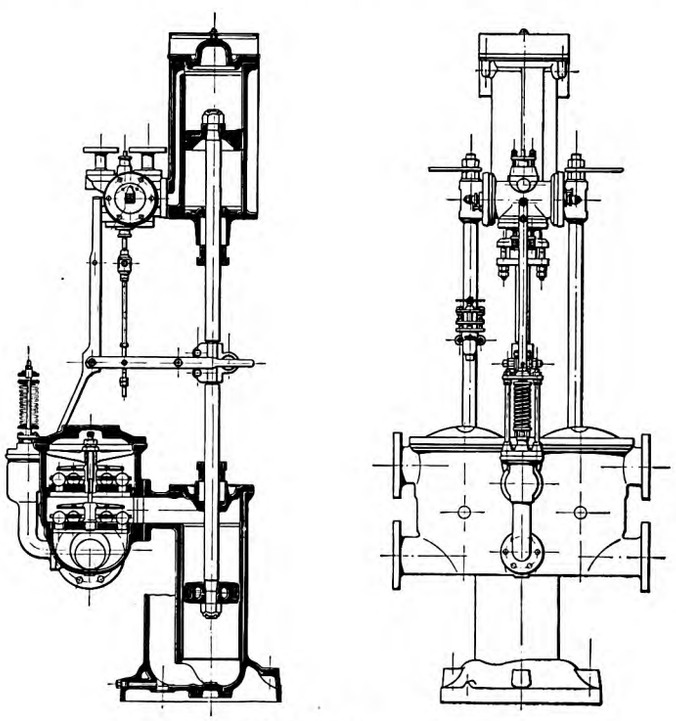
Main Pump for Hydraulically Closing Doors in Watertight Bulkheads



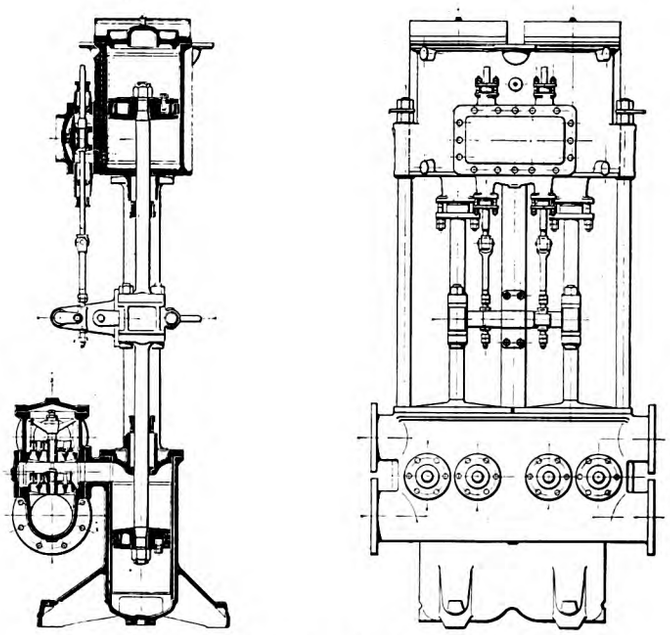
Main Pump for the Fuel Oil

into the oil tanks through the filling and circulating pipe, preventing excessive pressure or high temperature in the oil tanks caused by filling. A special reserve tank takes up the surplus of oil by means of an overflow pipe. Moreover this overflow pipe is used as a vent pipe, having its outlet at the top of the fore funnel. A simplex steam pump transfers the oil from the tanks on one side of the ship to those on the other side or to the settling tanks, which separate water from the oil before using it. From there the oil is drawn off by an oil feed pump through an interchangeable duplex suction strainer and then forced into the burner supply pipe through a steam oil heater and an interchangeable duplex discharge strainer. By the heaters, the oil temperature is raised up to 248 degrees Fahrenheit. The burner supply valve by-passes the surplus oil to the settling tanks or to the suction pipe. The piping is fitted with air receiver, to ensure uniform pressure in the burner tips. A second complete oil feed plant is installed as a stand-by.

The amount of oil in the bunkers, settling tanks and over-



Oil Fuel Pump



Lubricating Oil Pump

Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

flow tanks is indicated by means of pneumercators, which show the height of the oil levels.

All pumps and apparatus for oil burning service are arranged together at the fore boiler room bulkhead, to ensure simple and easy handling.

### Service and Fire Pumps

The deck wash and fire extinguishing pipes starting from the main distributing branch in the engine room are led as main lines inside the engine and boiler room hatches and from there in two lines through the whole ship.

Cold sea water is provided for all baths, toilets, lavatories and galley, cold fresh water for all first class wash stands, galleys, suite-de-luxe and hospital baths, and on each deck at many tapping points. Warm sea and fresh water is provided through circulating piping, having heaters in the engine room and tanks in the dummy-funnel. Warm sea water is led to all baths, toilets and lavatories, while warm fresh water is only provided for the wash stands of the suites-de-luxe, first class barber shop, and hospital baths.

The main stop valves for sea and fresh water piping are placed in the engine room hatch; there each deck may be shut off separately.

### Ventilation

First class inside cabins, all second class cabins, as well as crew accommodations get artificial ventilation, while in the third class, the gangways only are ventilated. Suction of air is fitted from all baths and lavatories. Artificial ventilation is also provided for galleys, provision and refrigerating rooms. Saloons, dining and smoking rooms receive an ample supply of fresh air; 21 discharge and 19 suction fans with electrical motors are arranged on deck or in special rooms. Five more fresh air fans are installed for ventilating the engine rooms and both stokeholes.

### Heating

Live steam, taken from the auxiliary steam piping, is throttled down to 59 pounds per square inch pressure for deck heating, and to 44 pounds per square inch for galley purposes.

Two main steam distributing branches are fastened in the engine room hatch, the heating branch being divided in such a way as to allow separate control of heating for crew and passenger rooms and baths. The different positions in each deck are under separate control by special distributing branches, the exhaust piping being similarly constructed. To prevent water hammering, the exhaust steam piping is inclined towards the engine room.

Copper coils, to be shut off at the steam inlet and outlet, are used as heaters in the cabins, supply and exhaust pipes being laid behind paneling.

### The Electrical Equipment

The main generating equipment consists of three 220 kilowatt turbine driven generators and the emergency equipment of two 25 kilowatt oil motor driven generators. All generators are direct current with a terminal voltage of 115 volts. The three turbine driven generators are connected in parallel to the same bus bars, but generally only two are running and the third is principally for stand-by service.

On the ship nearly all auxiliary machines are driven by electric motors. Consequently it was necessary to insure non-failure of bus bar voltage under all circumstances. This was taken care of by the patent of Carl Meyer, which properly equalizes the load even though one of the generators should unexpectedly cease to function.

The switchboard in the emergency dynamo room may be fed as well by the turbine driven generator as by the oil motor driven emergency generators. On this switchboard are the circuits for the emergency lighting plant, for the emergency equipment of the steering engine, the wireless plant, the position lights, the Anschütz gyrocompass, the alarm and telegraph installation. The two oil motor driven generators also run in parallel, but on a separate system from that of the turbine driven generators.

### Auxiliary Power Plant

The power plant consists of 104 motors having a combined horsepower of 900. Electric drive is used for the steering engine, the warping winches, the elevators, the ventilators, the pumps, the cargo winches and kitchen machinery. Only the specially built type of the electric driven steering gear will be described.

The rudder quadrant is driven by means of a self-locking worm by two steering engines, equal in size and fully independent, each driven by a separate electric motor. One of these two driving mechanisms is for stand-by service and the driving wheel of this machinery is not engaging with the toothed worm gear. In the steering engine room one change-over switch is provided for each of the two steering engines to connect them either with the steering wheel on the bridge or with the emergency steering wheel. In the first case the steering engine is driven by one motor generator by the Leonard system and in the second case by one normal tension switch with constant voltage and half slowed down speed. For working with the Leonard system two motor generators are arranged in the main generating station, one for stand-by service. Each of the two motor generators is connected with a steering lever on the bridge. The rudder motor turns back this steering lever to its starting point by electric synchronous transmission which is constructed according to our own patent system and replaces the old fashioned mechanical transmission.

### Electric Fans

The electric ventilating system is worth mentioning. The fan motors are started from one central switchboard in the main generating station by electric transmission turning the levers of the self-acting starters beside the motors. The speed of the fans is controlled from the same central switchboard.

### Electric Heating

Electric heating in addition to steam is used for the first class passenger cabins. This circuit is separated from the electric heating, of several heating plates in the saloons, of the hot water boilers in the pantry and of baking ovens and toasters.

### Lighting

The lighting plant is divided in all-day burning lamps, in switchable lamps and emergency lighting. The current for the distributing stations of the all-day burning and switchable lamps is conducted from the main switchboard by separate cables. The distributing stations for the emergency lighting are connected with the emergency switchboard, which is direct connected with the main switchboard but, if this connection is switched off, it gets the current from the emergency generators. The 600 lamps of the emergency lighting are distributed all over the ship, including all lamps of the engine and boiler rooms.

---

Lloyd's Shipbuilding Report.—The decline in world shipbuilding has now reached new low levels, both in respect to orders placed and work actually under way, says a statement just issued by Lloyd's Register of Shipping, giving returns for the quarter ended June 30. While a gain was shown in the first quarter of this year in the work on which construction was progressing that gain was eliminated in the quarter just ended, and all the shipyards of the world have only about two and a half millions gross tons of orders.

Generated on 2024-09-12 16:48 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Steamship America Becomes Largest Cabin Ship Afloat

## Extensive Alterations at New York Navy Yard Convert Vessel Into High Grade One Cabin and Third Class Passenger and Cargo Liner

ON June 2 the steamship *America* of the United States Lines sailed from New York for Plymouth-Cherbourg and Bremen on her first voyage as a one cabin and third class passenger vessel, after being extensively reconditioned at the New York navy yard. The principal alterations were carried out to take care of the increasing demand for good accommodations and service at more moderate rates than those existing for very large first class liners.

This vessel, formerly the *Amerika* of the Hamburg-American Line, built by Harland and Wolff, Belfast, in 1905, was among those vessels seized by the Government after the declaration of war in 1917. After her war service as a troop transport the *America* was placed temporarily in the transatlantic service with accommodations for first, second and third class passengers. The vessel was withdrawn from that service at the first opportunity for general reconditioning and extensive alterations to be converted into a high grade one cabin and third class passenger and cargo vessel, with the result that the *America* is the largest and one of the best cabin ships in service, fully in keeping with the significance of her name.

The reconditioning of the vessel, which was accomplished in 78 consecutive days by the New York navy yard, comprised a complete overhaul of her machinery, the dry docking of the vessel for scraping and painting the hull and extensive changes in the passenger accommodations, some of the most striking of which are described in the following.

### Main Social Hall

On "A" deck the space formerly occupied by the first class dining room has been converted to the main social room paneled with contrasting hardwoods in natural finish, chestnut, sycamore and mahogany on walls with chased bronze trimmings applied. The ceilings were painted and decorated in harmonious tints. Casement windows and a skylight covered with ornamental glass and mirrors give sufficient light in daytime, while numerous ceiling lights and wall brackets provide artificial illumination.

A teakwood parquet dancing floor covers about one-third the area of the room, flanked by rich carpet and rugs while rugs are also used on the dancing floor when it is not in use.

Comfortable furniture of mahogany and tapestry of a design to suit the period of the wall decorations has been provided and the effect, while simple, is harmonious and rich.

On this deck twelve new outside staterooms have been built in the space formerly occupied by the auxiliary dining room and men's and women's toilets were built along the centerline in order to increase the passenger accommodations.

Each of the new staterooms is equipped with one four posted bedstead with pullman berth over, one sofa berth with upper berth over, all of mahogany, two wardrobes and two lavatories with running water. The pullman berth, when lowered, rests upon the posts of the bedstead and hence is not dependent upon bulkhead fittings for support when occupied. The sofa berth, when unoccupied, may be made up as a comfortable settee. The whole arrangement has such flexibility that the rooms may be made to comfortably accommodate either one, two, three or four persons. The settees are upholstered to harmonize with the color scheme in these staterooms.

### Cabin Smoking Room

One of the features of this ship is the cabin smoking room which extends for two deck heights. The illustrations give an idea of the splendid general appearance of this room, the upper deck being, as shown, in the form of a broad gallery with an open space in the center, allowing light from the skylight overhead to illuminate both decks. This room is representative of a hunting room of an Elizabethan manor house, with solid oak hand carved woodwork.

### Cabin Dining Room

The space on "D" deck now occupied by the cabin dining room was formerly used as a second class dining room and social hall. This space was completely dismantled and fitted up and equipped as the cabin dining room to accommodate 328 passengers in one sitting. It is about 90 feet long, extends the full width of the vessel, and is located just forward of the main galleys and pantries thereby insuring good service.

The design of the woodwork is Colonial, finished in soft colors. Casement windows conceal the airports without excluding the light. A well has been opened over the center of the room, giving a sense of height and space. Tables for two, four and six persons are used throughout. Handsome electric light fixtures adorn the ceiling and walls and silver candelabra table lamps have been provided for each table. The deck is covered with rubber tile of marble pattern. A

## General Data: One Cabin and Third Class Passenger Steamship America

### General Information

**Service:** New York—Plymouth, Cherbourg and Bremen.
**Builder:** Harland and Wolff, Belfast, Ireland. Reconditioned by New York Navy Yard.
**Owner:** United States Shipping Board. Operated by United States Lines.

### Characteristics

| | |
|---|---|
| Length, overall | 687′ 0″ |
| Length, B. P. | 669′ 0″ |
| Breadth, molded | 74′ 3″ |
| Depth, molded | 52′ 5⅜″ |
| Draft, loaded | 33′ 5½″ |
| Block coefficient | 0.729 |
| Speed, loaded, knots | 15.9 |
| Framing | Transverse |
| Class | American Bureau of Shipping |

### Tonnages

(In tons of 2,240 pounds)

| | |
|---|---|
| Deadweight capacity | 12,560 |
| Displacement (loaded) | 34,575 |
| Displacement (light) | 22,015 |

(In tons of 100 cubic feet)

| | |
|---|---|
| Gross register | 21,145 |
| Net register | 12,257 |

### Complement

| | |
|---|---|
| Total officers and crew | 582 |
| Cabin passengers | 692 |
| Third class passengers | 1,056 |
| Total passengers | 1,748 |
| Total complement | 2,330 |

### Life Saving Equipment

50 lifeboats, accommodating 2,587 persons.

### Propelling Machinery

#### Boilers

| | |
|---|---|
| Number | 8-D.E. |
| Type | Scotch |
| Furnaces | 48 |
| Fuel | Coal |
| Draft | Howden forced |
| Total heating surface, square feet | 44,000 |
| Total grate surface | 1,092 |
| Working pressure, lbs. per sq. in. | 210 |

#### Engines

| | |
|---|---|
| Number | 2 |
| Type | Quadruple expansion |
| Size | 34x49x71x100—63 |
| Horsepower | 15,500 |
| Maximum horsepower | 17,500 |

### Capacities

#### Cargo Space

| | |
|---|---|
| Total bale, cu. ft. | 364,549 |
| Total grain, cu. ft. | 401,004 |
| Total available space for ship's stores, cu. ft. | 113,572 |

#### Bunkers

| | *Tons |
|---|---|
| Total capacity | 4,555 |

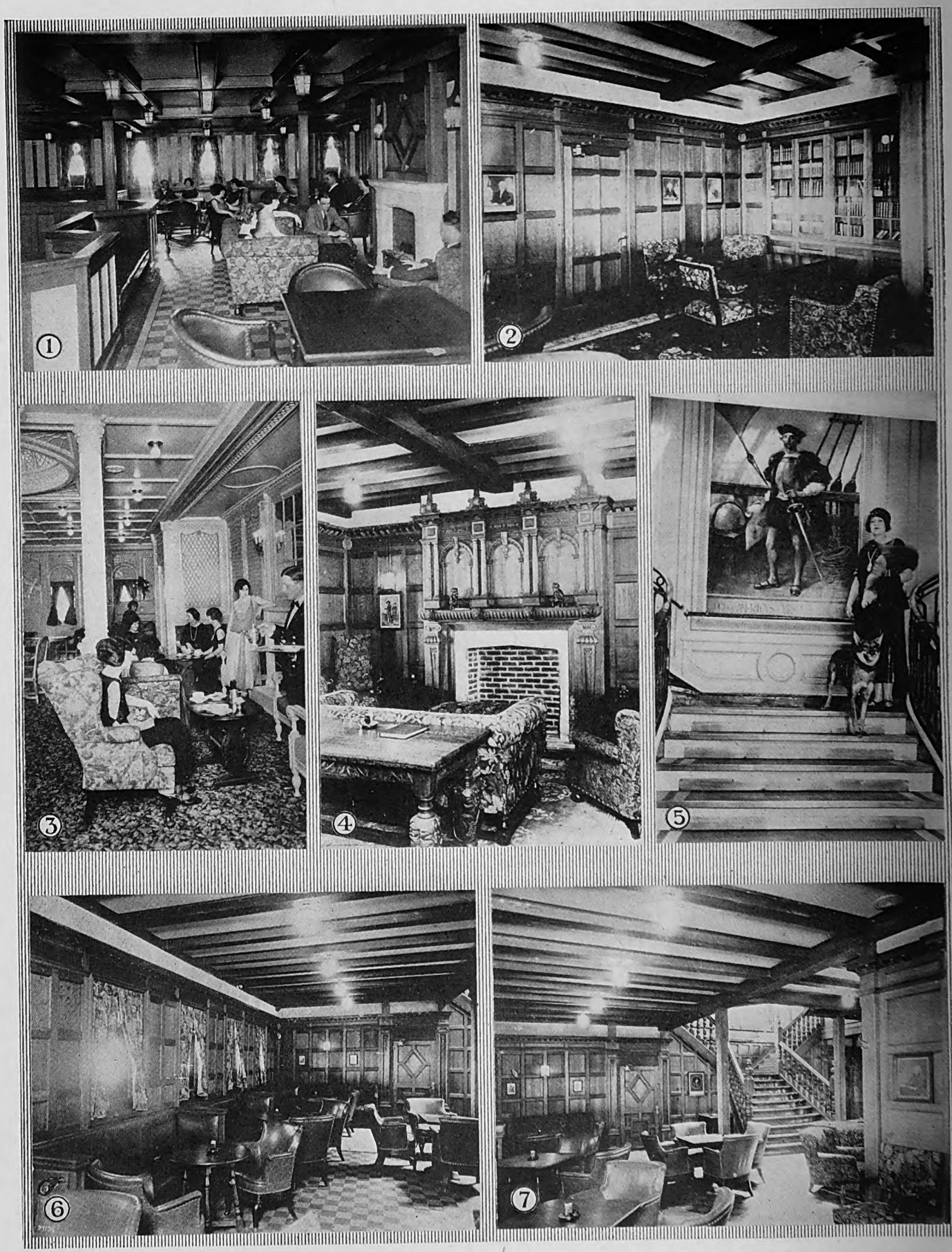
*45 cu. ft. per ton.

#### Tanks

| | Tons |
|---|---|
| Total fresh water | 3,945 |

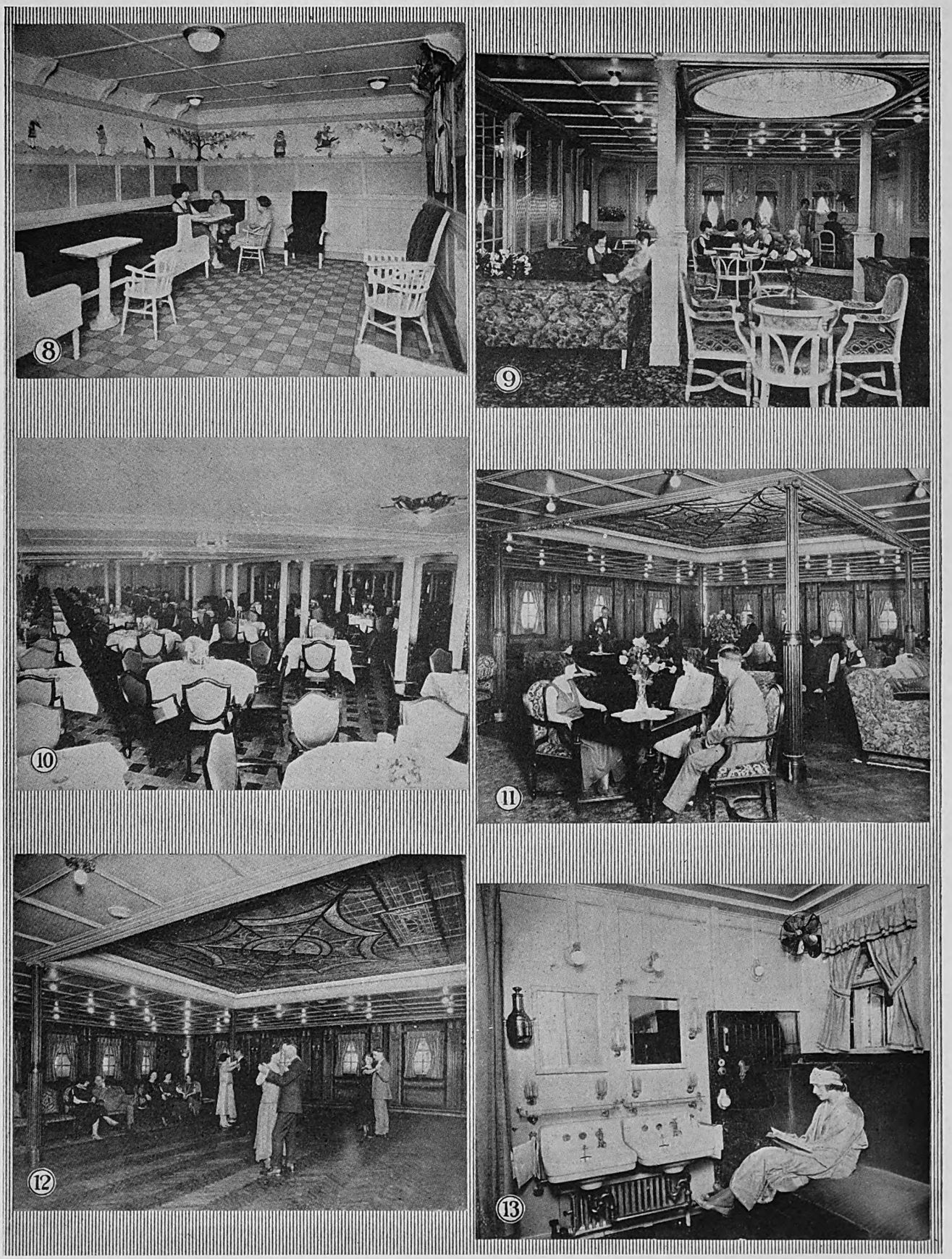


Generated on 2024-09-12 16:43 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



Interior Views S. S. America: (1) Upper Smoking Room, (2) Library, (3) Corner of Ladies' Lounge, (4) Fireplace in Smoking Room, (5) Grand Staircase, (6) Lower Smoking Room, (7) Stairway Leading from Lower to Upper Smoking Room

Generated on 2024-09-12 16:22 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



Interior Views of S. S. America: (8) Children's Playroom, (9) Ladies' Lounge, (10) Dining Room, (11) Social Hall, (12) Dancing in the Social Hall, (13) One of the Roomy Staterooms

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

glass partition at the after end separates the stair lobby from the dining room.

The dining room was designed by Messrs. Walker and Gillette, architects, New York City, who also selected the electric light fixtures and hangings and furnished the color scheme. Messrs. J. C. Knipp and Sons, Baltimore, Md., were the contractors for the woodwork and finish of this room.

### GALLEYS AND PANTRIES

After a careful study the galleys and pantries were rearranged and refitted in accordance with the best marine practice and are now so arranged as to give excellent service.

The cabin galleys and pantries are directly aft of the cabin dining room. The third class galleys and pantries have been rearranged and are now adjacent to the cabin galleys and pantries and the third class dining room is directly aft of the third class galleys and pantries.

Particular care has been taken to exclude all woodwork, as far as is practicable, from the galleys and pantries. This detail has been carried out even to table tops and shelving which in most cases are metal.

The third class dining room has been enlarged, altered and refinished to bring this room strictly up to the United States Line standards and now accommodates 360 passengers in one sitting. The old benches have been removed and comfortable swivel chairs installed.

### SUPERSTRUCTURE STIFFENED

Approximately 60 tons of steel were worked into the forward portion of the vessel's superstructure in the form of new deck plating, house plating, doublings, fashion plates, all with a view to providing additional stiffening to the superstructure where it was found to be required.

The ventilation systems, both mechanical and natural, have been thoroughly modernized and the air changes are in accord with the very best marine practice. Twelve new mechanical ventilation sets were installed and the old sets overhauled and extended. The natural ventilators were thoroughly overhauled.

### NEW WIRING INSTALLED

The ship was rewired throughout with lead and armored cable. New electric lighting fixtures were fitted and wired with the loop system with lights in staterooms controlled by three and four way switches. A new telephone system, of the Magnavox type, was installed. A new annunciator system, of the Cory reset type, was installed with a reset button at each stateroom door. The switchboard was remodeled. Reversite circuit breakers were installed on each generator feed. Power bus bars were separated from lighting bus bars. The speed of the dynamos was reduced 45 revolutions per minute and the field coils of each generator lowered one-eighth inch to compensate for the slower speed.

All main subdivision bulkheads have been thoroughly gone over and made absolutely watertight. Wherever practicable, watertight doors in main subdivision bulkheads have been permanently closed. The main watertight doors are operated from the bridge by the Stone-Lloyd system.

All piping systems were reconditioned and extended to suit the new arrangement.

The aero fire alarm system is fitted throughout the passenger and crew accommodations while the Rich system has been installed in the cargo spaces.

The entire work was carried on under the direction of Captain R. D. Gatewood, manager, Maintenance and Repair Department, United States Shipping Board. Plans and specifications, which were noteworthy for their completeness and conciseness, were prepared by the technical staff of the United States Lines, under the supervision of Mr. Carl E. Petersen, naval architect of the United States Lines, and Mr. A. D. Woods, naval architect of the United States Shipping Board, both of whom also supervised the work of reconditioning. Mr. B. D. Pender, assisted in the reconditioning work, having charge of all furnishings and stewards equipment.

# Only Ships Best Meeting Requirements Are Efficient

## Navy Design Methods, Allowing Several Basic Solutions, Could Be Used Advantageously in Merchant Marine Practice

By James L. Bates*

A NUMBER of years ago Rear-Admiral W. L. Capps, then Chief Constructor of the United States Navy, gave this advice to the writer: "Young man, it is better to be conservative during the design period than to be sorry on the trial trip." Doubtless the idea thus expressed is familiar enough. In fact, its very familiarity testifies to the general prevalence of dangerous optimism in design. However, in spite of the appreciation of the serious consequences involved, recurring instances prove that over-confidence, lack of thoroughness, even ignorance, are far more prevalent among us who design and build ships than we care to admit.

The following seven instances, all occurring within very recent years and in many cases coming under the personal observation of the writer, will serve to illustrate the nature of these shortcomings.

### CASE NO. 1

A vessel intended for a familiar service, one in which hundreds of vessels have successfully operated for years, recently went on her trials and realized about ½ her designed speed. Investigation showed a very poor form of hull for driving, very light, high speed machinery for the kind of service, propellers of inadequate diameter and area, and an underbody form and shaft location which rendered a material increase of propeller diameter very difficult, if possible at all. Her performance was ultimately improved after changes had been made in machinery and propellers; but this improvement was realized at considerable expense to the owners, both because of the actual cost of the changes and because of the loss in income due to the vessel's enforced idleness.

### CASE NO. 2

After successfully running for some years, a vessel was taken out of service to be fitted with a new and much heavier machinery installation. Deep longitudinal girders were built into her hull, and everything was nearly ready for the actual placing of the machinery when it was discovered that several of the heaviest longitudinal strength members were cut in the vicinity of the forward quarter point. An investigation showed that at this point an excessive concentration of stresses might be anticipated, particularly when being driven into a head sea. Compensation

*Author of Basic Design; in Charge of Basic Design Section, Bureau of Construction and Repair, Navy Department, Washington, D. C.

Generated on 2024-09-12 16:22 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

was designed and fitted with satisfactory results, but at the cost of much worry and some expense and delay.

CASE NO. 3

An oil tanker was built, standard in type and in nearly all features of construction, but she had great beam and nearly twice the metacentric height usual in vessels of her type and size. This vessel at sea developed a complete period of roll of from 7 to 8 seconds. After several seasons in service the ship's structure showed signs of serious racking.

CASE NO. 4

A cargo vessel was built, slightly larger than her predecessor also built in the same yard. In service she showed insufficient stability. Consequently, she has carried during her entire life a large amount of permanent ballast, a dead loss in cargo capacity.

CASE NO. 5

A vessel was designed for passenger service. When the plans were well advanced and construction actually begun her prospective owner decided to put on an additional complete deck in order to increase her accommodations and, incidentally, their own income. The additional deck was fitted, but no change made in the original underbody. In service the vessel was very tender, nearly always requiring water ballast and the most constant attention to keep her upright.

CASE NO. 6

A completed vessel went on her trials and failed to make her speed. The contract provided a money penalty for such failure. A careful investigation, which was undertaken to ascertain the reasons therefor resulted in the discovery that the trial had been run in shallow water, which in itself put the vessel at a disadvantage, and that the form of hull aft was such as to render the propellers very inefficient. Of course, the trial could be run again under proper conditions, but the hull form could not be altered. Therefore, the inefficient hull must be driven during her entire period of service.

CASE NO. 7

An expensive yacht was built of materials unsuited to service in salt water. This vessel literally fell to pieces, becoming a total loss.

Such mistakes not only increase the original money outlay, but frequently decrease the ship's earning power throughout her life. They are generally chargeable to faulty design. In some of the above cases the naval architect, and in others the marine engineer, was the culprit. Different reasons could be given for such failures. Poor judgment or lack of knowledge is sometimes the cause. Sometimes an unwillingness on the part of the business men involved to secure expert advice because of the added expense, or an anxiety to hurry the job into production at the earliest moment is responsible. Attempts to utilize previous unsuitable designs as the basis for the new, or to crowd too much into limited dimensions, are sources of trouble. The important facts are that such serious failures, and many more like them, have occurred, and, knowing them, we should do our best to prevent their repetition.

GIVE MORE TIME TO EARLY STAGES OF DESIGN

The writer believes that more time given and more attention paid to the early stages of design will assist materially in increasing the efficiency of our shipping because it will guard against mistakes such as those above described. Such a claim appears reasonable enough when one reflects that this, the preliminary design period, is the period in which type, size, power, dimensions, etc., are fixed, and that the work of detail design subsequently carried out is, to a large extent, a matter of routine which, with moderate care and intelligence, will be satisfactory. By devoting relatively more time to the consideration of these principal features and their proper relation one to another, not only is more rapid progress during the detail design period assured, but a greater assurance that the final result will be satisfactory is obtained.

**These methods and suggestions, valuable as they have proven in the work of the Navy Department, where so many types and sizes of vessels must be investigated that it is necessary to employ certain men almost constantly for the purpose, may not prove of such value to private concerns where the problems which require such investigation are less numerous. Nevertheless, the naval architects of these concerns and as many of their assistants as necessary should be thoroughly familiar with these principles and the methods of applying them efficiently so as to be able to perform this work when required. Organizations which are not warranted in employing regularly a force qualified for such work will serve their own best interests by securing competent advice when needed.**

FORMER NAVY METHOD

The development in the preliminary design of ships which has taken place in the Bureau of Construction and Repair, Navy Department, during the past fifteen years will serve to illustrate these points. When the first of our all-big-gun battleships was designed it was the practice to select type and dimensions and proceed at once to prepare a general arrangement layout to a scale of 1/16 inch = 1 foot. This layout was made in considerable detail, including profile, deck and platform plans and type sections. All the main structural and many minor bulkheads were shown. The assignment for the use of the principal compartments was indicated. Boat stowage was worked out. Gun positions for both main and secondary battery were fixed. An approximation to the weight and center of gravity was prepared. If this showed satisfactory results, the plans, together with the necessary descriptive matter, were forwarded to the Department for examination, comment and approval.

The considerations of strength, cruising radius, and even speed and power were somewhat superficial being largely left for a later date. The data presented were carefully considered by the Department and returned to the Bureau. The comment made, as might have been expected in view of the character of the information furnished, was in great detail, frequently covering such minor items as the location and arrangement of offices, pantries, etc. In other words, both in the Bureau and the Department, much time and attention was given to detail at a period in the design when all the consideration should have been given to features of more general importance. The result was that but a very few solutions to a given design problem could be worked out with the time and force available, and that but a small portion of the possible field could be adequately covered.

PRESENT NAVY METHOD

At the present time the problem is attacked with the idea of developing the possibilities of a number of different designs and presenting them in comparable form so that

Generated on 2024-09-12 16:49 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

a design may be adopted, not merely because it has been prepared and meets the requirements, but because it has been shown by comparison with a sufficient number of others to *best* meet the requirements.

The work is carried out in a logical series of steps.

*First,* a displacement suited to the type of ship and the armament, protection, and machinery contemplated is selected.

*Second,* a length suited to the speed and displacement is adopted.

*Third,* a depth sufficient for a satisfactory strength girder and a proper arrangement of decks is selected. Suitable midship scantlings are also outlined.

*Fourth,* a beam which will insure adequate stability and a reasonable period of roll is picked.

*Fifth,* a suitable form of underbody is chosen and an estimate of the power for the desired speed worked out.

*Sixth,* a small scale plan (from 1/50 inch to 1/100 inch = 1 foot), showing general arrangement of the principal features and giving the principal characteristics in tabular form, is prepared.

*Seventh,* a preliminary body plan for use during the preliminary design stage and suitable for the preparation of a model for towing in the experimental basin is made.

*Eighth,* an approximate estimate of weight in the several conditions of loading is made.

The above is as accurate a statement of the usual procedure as can be made. As a matter of fact, it is usually necessary to take some of the steps simultaneously in order to insure maintaining a proper relationship between them.

### Standard Forms Used

Standard forms have been prepared for use in connection with the above steps so as to secure a proper order of procedure and minimize the possibility of omitting any of them.

Special compilations or arrangements of data have been prepared so that these various steps may be taken with a minimum of effort and with minimum danger of error.

The seventh step is sometimes omitted or only partially carried out if the urgency of the case demands that it be taken into consideration.

When the sketch plan and the data connected therewith are complete all the information available is tabulated upon standard sheets so that it is readily comparable with similar information previously tabulated for other vessels of the same type and similar size. Such comparisons are very valuable in the discovery of inconsistencies and in bringing out points of difference.

Under this system it is possible to prepare data for submission to the Department upon very short notice, and these data are much more complete and reliable insofar as basic considerations of importance are concerned than were those submitted under the old method. Moreover, the effect of the present method is to center attention on the more important features and to relegate to their proper time and place matters of detail arrangement and construction.

### Results Obtained With This Method

An idea of the character of the results obtained in the design of naval vessels by the use of these methods may be obtained from the following instances:

A battleship had been tentatively outlined as to displacement, dimensions and power. As the result of investigation, her length was materially decreased, her draft increased and her power slightly increased, these changes combining to effect a reduction in the required displacement of nearly 5 percent without the sacrifice of any important feature as a consequence.

A submarine which had already passed through several different stages of investigation was altered in her curve of sectional areas, and her waterline forward was changed so that her speed was increased about 7 percent without any increase in power.

A vessel of a given displacement and fairly well outlined design was given careful consideration from the standpoints of form of underbody and arrangement of strength members and of scantlings. The changes made resulted in increasing the ship's battery by 25 percent without sacrificing other features of value.

### Application to Merchant Marine

The application in principle, at least, of the previously described ideas should prove beneficial to many design organizations. In order, however, to realize the fullest benefit therefrom there should exist a clear conception of the essential differences between the general and the detail considerations of design; a realization of the number of solutions possible for any design problem, and an appreciation of the facilities offered by properly worked out preliminary design methods for bringing out the salient features of the different solutions in their proper relations.

A competent technical staff trained to the viewpoint of the preliminary designers should be available. This is not so simple a requirement as it might at first seem. It is frequently difficult, sometimes impossible, to educate the man, who has spent years in acquiring an accurate knowledge of the details of ships, to ignore them temporarily in order to deal with the general features such as type of ship, hull form, power, etc.

### Value of Experimental Model Basins

There must also exist an appreciation of the value of and a willingness to utilize the facilities of experimental model basins, testing laboratories, etc., or at least to secure advice and information from representatives of such organizations or other experts relative to features or appliances not previously handled and definitely understood.

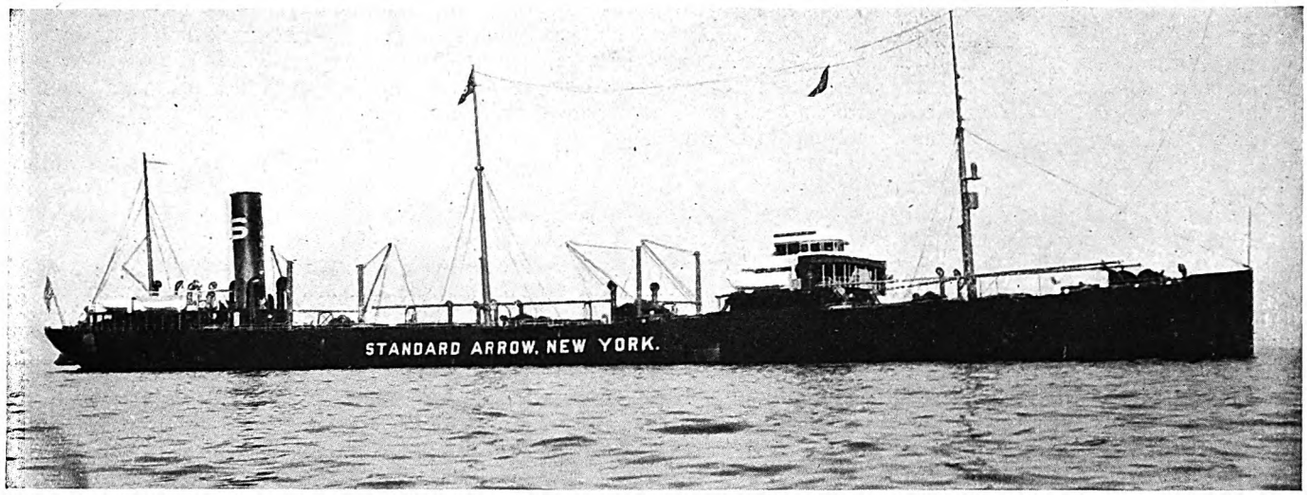
Each organization will increase its efficiency by carefully arranging all its available data in convenient form for ready reference, as well as by utilizing published data closely applicable to the problems of the especial field which they cover.

In the Bureau of Construction and Repair, Admiral Taylor's "Speed and Power of Ships," Professor William Hovgaard's "Structural Design of Warships," the writer's "Basic Design of Modern Vessels," published as part of the "Shipbuilding Cyclopedia," as well as numerous articles published in the technical press or read before technical societies, are constantly used for reference in the solution of problems to which they apply.

## Liability for Personal Injury Fixed by Maritime Law

IN Payne vs. Jacksonville Forwarding Company, American Maritime Cases Vol. 1, page 524, the libelant was chief engineer of the S. S. *Harrish,* which had run aground, and was injured while voluntarily assisting the crew of a tug in making fast a line to the *Harrish.* The tug surged ahead, the line broke and libelant was injured. He filed a libel against the owner of the tug charging negligence. The Court said, that since this is a maritime tort respondent, liability is fixed by the maritime law and not by the Hazardous Employment Act of Florida and therefore this being a suit by a seaman for damages and not for maintenance and cure and wages, the negligence of the master is no ground for recovery, as section 20 of the Seamen's Act of March 4, 1915, does not make the shipowner liable for the master's negligence.

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN




Typical Standard Oil Tanker

# Notes on Efficiency in Operation of Oil Tankers

## Proper Design for Specific Trade, Upkeep and Eternal Vigilance Over All Divisions of Operation, the Vital Factors

By Townsend J. Smith*

OF the various types of ships which make up the American Merchant Marine, the oil tanker is the type at present having the greatest percentage in service. Any economies, therefore, which may be attained with these vessels will have a proportionate influence on the whole. In a broad sense, the efficient and economical building or operating of tank steamers offers the same problems as does any other fleet, but there are certain points which require particular attention, due primarily to the kind of cargo carried and the short periods allowed in port for overhaul, running repairs, reception of stores, etc.

As a first consideration, it is well to have a clear understanding of what it meant by "economy." Economy is defined in the dictionary as "thrifty and careful administration," and "management without loss or waste." This describes exactly the ideal of every builder and operator, but the actual obtaining of the condition, where there is no loss or waste, is still in the future.

Economy is not necessarily a minimum money expenditure, although many a famous and prosperous steamship company has been managed so that one shilling has worked overtime and done the work of two, but economy can best be promoted by a careful watchfulness that expenditures are only made for items which have a present or future value. Thus it is the best of economy to have spare steering gear worms or segments in stock, as these parts, from experience, are found to require renewal at times, but it would be very poor economy to keep a spare bed plate for the same engine, a part which is generally good for the life of the ship.

In the search for true economy, we may divide the subject into three sections:

1. First cost,
2. Repairs and maintenance,
3. Operation.

### Proper Design Essential

As has been often stated the real economy in first cost is found where the vessel is carefully designed for a certain trade and built as large and as powerful as the trade demands, but no larger and with no great excess of reserve power; power which will seldom be needed. In tank steamers the result of experience must go hand in hand with the best guess as to the future; for guess it must be to a large extent, with old oil fields and areas constantly going dry and new fields in distant parts of the world opening up daily. One way to anticipate these changes is to design the vessel so that alterations may easily be made, should occasion arise to put the ship in another service from that originally planned. In some cases it is well to provide extra large heavy duty pumps and heater coils for heavy cargo although gasoline may be the oil generally carried. Each oil company has its idea as to how far to provide for future contingencies, as each has its preference for type and size of ship.

To enter into the relative advantages of Diesel and steam driven tankers is to enter a discussion which can not be definitely answered now. Here again preference, or its half-brother prejudice, may enter in. So far it would seem that the human factor operating has as much or more to do with results than mechanical refinements.

Consumption of fuel down to .304 pound per indicated horsepower hour, of lubricating oil to .00255 pound per indicated horsepower hour, and a cost of fuel and lubricating oil down to 5.63 cents per 1,000 ton-miles, as recently reported for a 15,000-ton tank motor vessel, appears very attractive if these figures tell the whole story of expense entailed with motor operation.

As a practical question we need not be greatly concerned as to the kind of power outfit of new tank ships as the world seems well supplied at present.

The conversion of steamers to motor drive is a special condition requiring particular consideration for each case.

### Tonnage Measurement

A point sometimes overlooked in this country, perhaps not so much in recent years as formerly, is the tonnage measurement, a fee which is a fixed charge as long as the ship is

*Standard Transportation Company, New York.



Generated on 2024-09-12 16:50 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

navigated and may even form a basis for taxation when the vessel is laid up. Any reduction possible here in structure or arrangement, even if it requires alteration and read-measurement after building, is well worth looking into.

With the competition in American yards as keen as it is at this writing, any suggestions as to cutting down prices are apt to draw out remarks "not only loud but deep." However, it would seem that the cost of auxiliaries and their repair parts are out of line (as the stock brokers have it), with the cost of other component parts. This point has recently come to the fore in British yards also. There is a wide range in the first cost due to the various standards of owners with regard to outfitting, extra parts carried, reserve stores, etc. These are often overestimated and if the ship trades to ports with ordinary sources of supply and with ordinary repair facilities, much may be done to cut down expense here.

The form of hull and disposition of machinery has become, if not standardized, close to it, not so much from theoretical considerations as from experience. The present day practice of locating the machinery aft has much to recommend it and leads to a fairly good distribution of strain in the loaded vessel. The necessity of removing the thrust block and possibly an eccentric, when drawing the tail shaft, together with rather restricted handling room, are the detailed objections.

### Repairs and Maintenance

Proceeding on our second line of inquiry, economy in repairs and maintenance, we find the following sub-divisions, all fluctuating widely at different times, with different owners, and with different types of ships:

a. Ordinary upkeep.
b. Bottom painting and under water care.
c. Attention to "damage and accidents."
d. Insurance surveys, and governmental examinations.
e. Carelessness.
f. Obsolescence.

### Ordinary Upkeep

Any structure exposed to the elements is bound to suffer wear and corrosion, the principal cause of wastage in a steel structure must be guarded against. Paint of a good quality is the usual retarding agent employed but it is more than wasted unless the surfaces to which it is applied are dry and free from scale. Scaling in itself is not an attractive job and unless someone with good eyesight is employed to follow up this work, corners and backs of reverse bars, clips, surfaces above a man's reach, etc., are very liable to be brushed over without regard to the condition, and corrosion still goes on unchecked.

The preservation of wood decks by recalking after a year in service and the paying of the seams with a proven composition is of greater value than merely the saving on the wood, as once water finds its way through the seams, the plating below starts to corrode.

Although it would seem unnecessary to call attention to this, the keeping free of wildcats, valves, roller chocks, goosenecks, etc., is an important point as the failure of these to function means just so much first cost locked up without a return in service.

### Upkeep Depends Largely Upon Personnel

Ordinary upkeep is a matter partly in the hands of the shore staff but the actual work is largely in the charge of the ship's officers, so that a fresh coat of paint may cover many a fault or it may be the sign of a most intelligent superintendency and care.

Up to the present no satisfactory paint or solution has been found which can be used on the interior surfaces of a cargo tank. Many oils are corrosive in action; especially those containing sulphur, so that in tank vessels, corrosion and scale are generally found on both sides of the shell and bulkhead plating. With a vessel continually in "heavy" oil service this scale forms more slowly and is not so detrimental as when it is on the surfaces of "light" oil tanks where particles or slabs of rust dissolving may cause a cargo to be off color; or if not dissolved, may find its way under valve seats and discs causing "mixed cargoes," reports of leaky valves and pipe lines. In general it will be found that straight way brass mounted gate valves, with renewable discs, hand holes, etc., give the best service here, although the British have a strong leaning toward the globe valve with its more tortuous passage but more easily ground in seat.

Pipe lines are generally found to go first outside at the threaded ends and here a rust proof mixture will prolong the life somewhat. Another scheme where lines have rusted due to drainage lying in the bottom is to turn the pipes 180 degrees, but it is questionable if the saving in doing this is worth while.

### Bottom Painting and Under Water Care

The question of dry docking and painting under water body is the same with tank steamers as with other vessels. Where certainty of route can be assured, once in eight months makes a schedule frequent enough to allow examination of under water fittings, etc. Renewal of the protective zinc slabs will probably be necessary then. These have proven their worth and, even with steel or iron propellers, should be fitted to combat the action of the couple set up by steel of hull, tips of blades and brass in stern bearing. Bronze studs in sea chests are worth the expense, but it is questionable if entire bronze strainers are worth while.

Painting at night is a very uneconomical performance for many reasons and is only resorted to under great stress.

### Attending to "Damages and Accidents"

One item which may need close attention, in fact generally receives it, may be classed as those miscellaneous damages caused by tugs, lock walls, bridge abutments, barges alongside, etc. If serious they are generally surveyed and permanently repaired but if not, especially if the owner's agents are responsible, the repairs, due to shortness of time in port, are "put off until next trip." Generally any damage near an oil tight bulkhead, sea connection or scupper is repaired. In course of time these damages taken all together may amount to a very considerable item.

This brings in the question of steaming and cleaning tanks, a very expensive operation, the cost of which may run up to double or quadruple the direct cost of repairs. However, work should never be taken in hand until the tank in need of attention and the one each side of it has been certified. The drainings from pipe lines, valves and pumps should be disposed of or these parts blanked off while repairs are in progress. So important is this that the authorities in many British ports require a chemist's test to be made and certificate to be issued each working day. As is well known the liquid cargo is comparatively harmless when open to the air, but the gas generated is highly explosive, lodging in the corners, behind brackets, valve pockets, under loose scale, etc. No amount of care can be considered excessive.

Some of the tank cleaning superintendents have become so expert that they have been reported to have struck a match in the tanks so that the chemist would have a good sample. No better display of self-confidence can be imagined.

### Insurance Surveys and Governmental Examinations

The classification survey is another division where economy is best served by care in the original design as to accessibility, minimum of structural parts and attention to the immediate making good of small damages, etc. The drawing and examination of tail shaft, opening up of pumps, sea valves and the machinery survey in general, follow the usual lines. The testing of tanks if the rules are followed literally is

Generated on 2024-09-12 16:48 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

a time and money consuming operation, but the societies accept the filling of alternate tanks with cargo as a bulkhead test and are generally liberal in their interpretation of the rules with bona fide owners, recognizing that the time element is most important. The survey periods on many tankers were entirely disorganized during the war, but there is no record of more than normal wastage in this period, which speaks well for their previous upkeep and condition.

With British ships the Board of Trade, while careful of the safety factor and seaworthiness of the ship, is not concerned with details and ordinary good practice may be assumed as receiving their sanction.

The United States Steamboat Inspection Service requirements, while not directed so much as to the cargo in tank vessels, are particularly explicit as to requirements for the bunkers and oil burning equipment, so that not many special economies can be made in the original installation and duplication of heaters, strainers, etc. It is not good economy to aim at simplifying the piping by too much interchangeability of pump services, especially should bilge and fire lines be independent of cargo piping, with no cross connections.

The United States annual steamboat inspection ruling that the cargo should be out of the vessel when undergoing inspection works a particular hardship on tankers. The original motive behind the requirement was probably to determine the condition of the ship's interior structure, but this is usually impossible on account of gas remaining from the cargo. The fact that the bulkheads are spaced so much closer than with other cargo vessels insures seaworthiness and this empty ship ruling might well be rescinded.

### CARELESSNESS

It is safe to say that 50 percent of the accidents to personnel, auxiliaries, cargoes, etc., are due to carelessness, pure and simple. This is a matter which is partly controllable but with ever-changing crews not possible to eliminate. Accidents are unavoidable but errors of the same kind must not be repeated by the same people. The great danger lies in the mixing of the cargoes from various tanks through wrong manipulation of valves. It is usual to paint hand wheels of valves for different services distinctive colors and it has been suggested as a further precaution for night handling that they be of different shapes; hexagonal, square, offset vertically, etc. A very definite line of demarcation as to the duties of deck and engine room crews must be insisted on in all matters pertaining to pumping cargo.

In speaking of carelessness we can go one step further and include sabotage, which, while not very often experienced, should be borne in mind.

### OBSOLESCENCE

This term includes not only physical deterioration but more especially the condition arrived at after several years' hard service or when trade conditions have changed. This means in a tanker that the pumps and pipe lines are too small, loading and discharging facilities limited, speed below modern requirements and cargo capacity too small for up-to-date shore receiving and storage plants. Types too are superseded. From the original tank ship until recently the poop, bridge and forecastle ships were used, but now only shelter deck ships are considered in the larger types. These in turn may be replaced by another style in the future. The whaleback is in the classic example of a fad, which, while not by any means a failure, was not suitable to survive in competition with more normally formed hulls.

### OPERATION

Arriving at our third division, operation, here we have an intangible target to shoot at, as no standard can be laid down as absolutely the point of 100 percent efficiency. The following sub-divisions as recently stated give normal figures for operation excluding corporate overhead and taxes:

| | Percent |
|---|---|
| Depreciation (5 percent of value) | 6.7 |
| Interest (5 percent of value) | 6.7 |
| Insurance (at 3.75 percent of value) | 5.1 |
| Repairs | 11.6 |
| Wages | 21.2 |
| Subsistence | 4.2 |
| Fuel | 33.6 |
| Stores and equipment | 9.4 |
| Miscellaneous | 1.5 |
| Total | 100.0 |

That these percentages are fixed for any one ship or fleet for any considerable time is open to question.

Various standards of efficiency have been proposed when putting ship against ship, such as ton-mile cost, tons carried per year, maintenance of repair cost per deadweight ton, etc., etc., many of which depend on the personal opinions of the compiler. Any comparison embracing net tonnage is of no use whatever, as net tonnage is an arbitrary thing with no real relation to the size of "ableness" of the vessel.

The elaborate theoretical tables and formulæ sometimes developed which give a numerical index of performance are not to be depended upon, as they require figures and costs seldom available in a form to be used in combination with technical matters and it is hopeless to expect the purely actuarial and engineering divisions to agree on the relative importance of each other's points or data, even should time allow an extended analysis. The action of the U. S. Shipping Board in building up a staff of research and trial experts is a move which might well be followed by private companies, provided the result of such inquiries were promptly put into practice and not made merely the contents of some enthusiast's data book.

The two largest items in the cost sub-division above are wages and fuel. The costs in both cases are set by general conditions over which the operator has small control and his only hope for economy is in using his labor to the best advantage with his fuel at a minimum, viewed from every angle.

The subject of careful fuel burning with both coal and oil has received much intelligent attention and experiments of all kinds are constantly in hand. The literature here is very extensive, so much so that many of the fuel oil advertising catalogues might well be used as text-books in thermodynamics. With few exceptions any of the good fuel burning systems will bear comparison with any other.

The same spirit of inquiry has been shown lately with regard to economical handling of feed water heaters, superheaters, electric auxiliaries, etc., improvement in any one of which is a subject too large for this article.

In tankers, the cargo pumps may be considered the heart of the outfit and the pipe lines the arteries. Compound pumps have not found extensive favor in spite of their lower steam consumption in theory. Up to the present 12 inches is the most convenient pipe size for main lines in a large ship with 8 by 10-inch discharges. One detailed source of loss both in fuel burned and in material wasted occurs when the insulation of deck piping is carried away by seas. This damage the shelter-decker escapes. Ordinary covering is short lived and with a double pipe arrangement the effect is often just the opposite to the designer's intention, due to water lodging in the outer casing. This is only one point of the many that will occur to any one who has ever dealt with this class of ship.

To repeat what was stated at first, there is no easy road to economy and with every care one year's showing may be very poor when matched against another's, since absolute standards are impossible and a thousand factors enter the problem. It is a subject not taught in the books although books may show the path.

To sum up: Eternal vigilance is the price of liberty—from extravagance and a deficit.

Generated on 2024-09-12 16:18 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Applications of Arc Welding to Ship Construction—II

## Details of Welding Construction—Repairs to ex-German Liners — System for Designating Types of Work

By E. H. Ewertz*

THE Electric Welding Company, Gothenburg, Sweden, constructed in 1920, the first electric arc welded ship in that country. This was a tugboat 52 feet 6 inches long, 13 feet 6 inches molded breadth and 7 feet molded depth, having a draft of 3 feet 6 inches. The construction was in accordance with Lloyd's rules for riveting but welding was used throughout, eliminating practically all riveting. No recent report is available as to her performance.

About the time this tug was built in Sweden by the Electric Welding Company, a similar size tug was constructed by licensees of the Kjellberg system in Caen, France.

From the shipyard of Kyle & Purdy, City Island, New York, N. Y., a torpedo boat was launched in December, 1920, called the *Sea Hornet*. She was really a motorboat, 58 feet long, with a 600 horsepower engine having a speed of about 35 knots and a cruising radius of 800 miles. This boat was constructed of No. 10 gage steel plates, having 1 inch by 1½ inch angle frames. Bulkheads were fitted so as to make her practically non-sinkable. Electric arc welding was used throughout for all joints, the shell being all butt welded so as to leave a perfectly smooth surface. Thousands of miles have been covered by this motorboat up and down the Atlantic Coast in all sorts of weather and after ten months' service no defects were found.

*General Manager, Moore Plant, Bethlehem Shipbuilding Corporation, Ltd., Elizabeth, N. J.

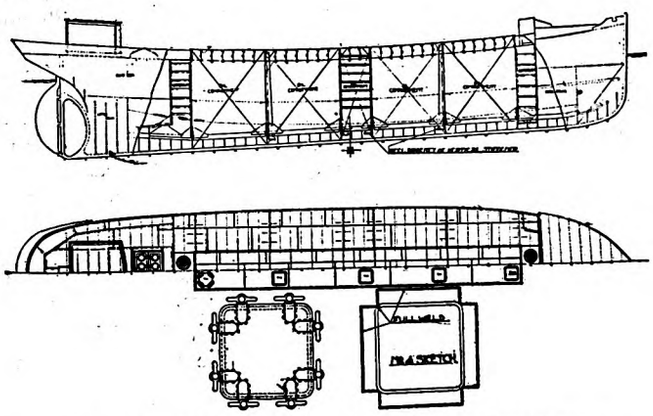


Fig. 22.—Profile and Half-Plan of Dairyo Maru

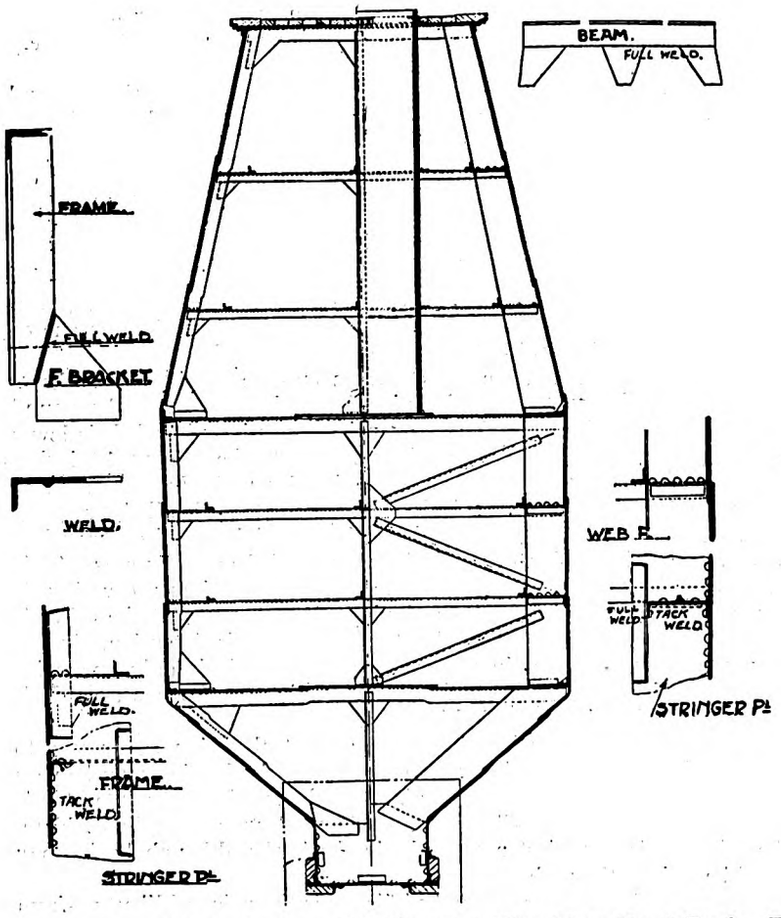



Fig. 23.—Midship Section of Caisson for Hikoshima No. 2 Dock

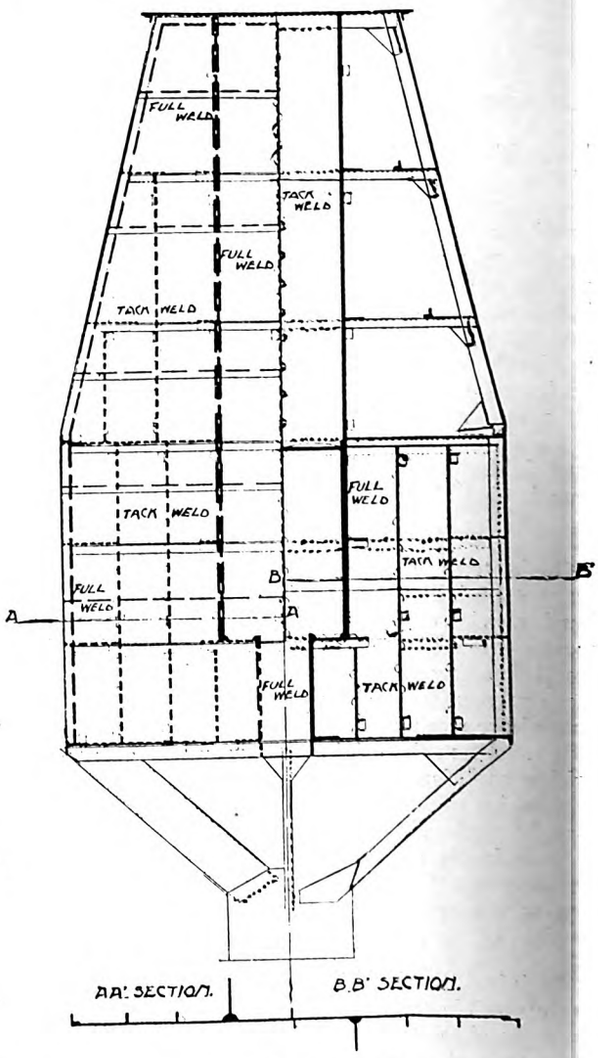



Fig. 24.—Watertight and Partial Bulkheads of Caisson



Generated on 2024-09-12 16:47 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

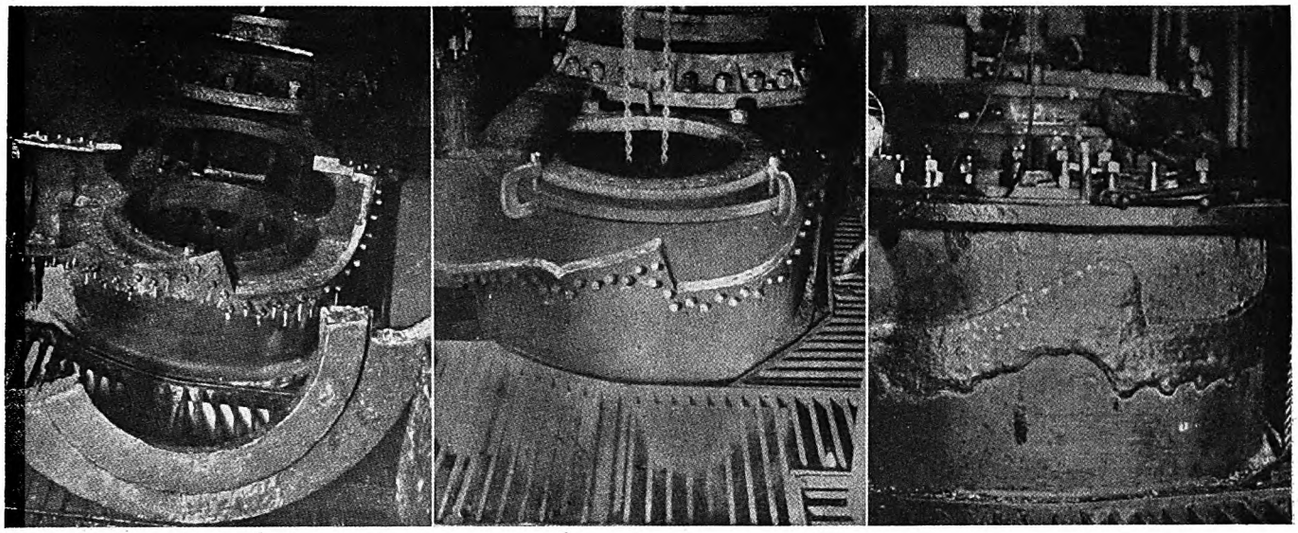


Fig. 25.—Repair by Arc Welding of Difficult Break on First Intermediate Pressure Cylinder on S. S. Pocahontas (ex-Princess Irene)

In Japan we find the electric arc welding used extensively in new construction as well as in ship repairs. The Mitsubishi Dockyard and Engine Works at Nagasaki are licensees of the Kjellberg arc welding system, and in a paper read by Mr. M. Haramiishi, general manager of the Kobe plant, before the Japanese Society of Shipbuilders, we find that in 1920 they undertook the conversion of the steam trawler *Dairyo Maru* into an oil lighter, capable of carrying about 300 tons deadweight.

### How Reconditioning Was Done

This trawler was 95 feet long with a beam of 26 feet, and a depth 12 feet 6 inches. The wood deck, longitudinal bulkheads, bunker, casings, engine and boiler foundations as well as deck houses, funnel, mast, deck and engine machinery, piping, shafting, etc., were removed and six new oil tight bulkheads, forming two cofferdams and five oil compartments, with an expansion trunk extending the full length of the oil compartments were installed. New bulkheads were fitted, floors and reverse frames were removed and new bulkheads welded to the frames with a continuous weld to the shell and bulkhead on one side and tack welded on the other side. Deck plating was butt welded both on the ends and sides of the plating. Also the original stringer bars were cut out, the holes welded up and stringer plates welded to the shell plating. Reinforcing angles were fitted on the underside of the stringers between frames.

The expansion trunk side plating was connected to the deck with angles having full welds, heel and toes. Stiffeners of flat iron were welded on edge to the side plates. The trunk top plating was riveted to the beams and full butt welded at seams and butts. Oil hatchways were formed by angles having corners cut out and bent to form the square. This bar was welded heel and toe, and the hatch cover hinges and fastenings were tack welded on the edges, no holes being used, thereby eliminating any possible trouble of leaks. Bulkheads were welded much the same as deck plating. After completion, the tanks were tested with a 6 foot head, and some slight leaks were found where overhead welding had been used but these leaks were made

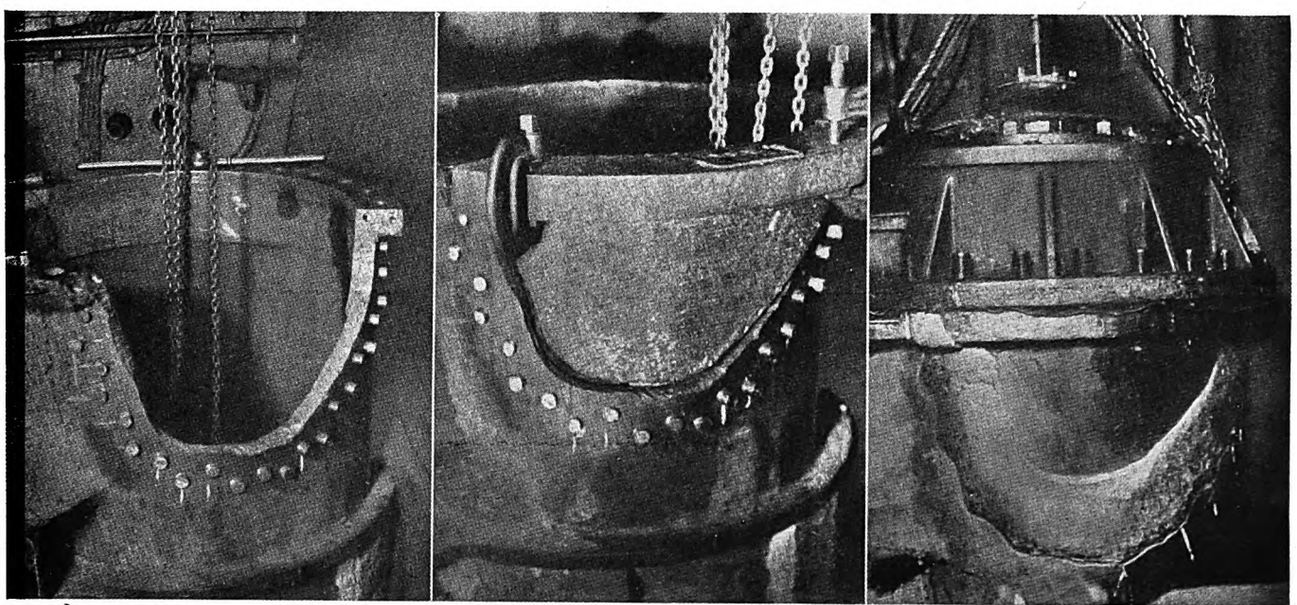


Fig. 26.—Method of Repairing Broken High Pressure Cylinder on S. S. George Washington by Means of Arc Welding

Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

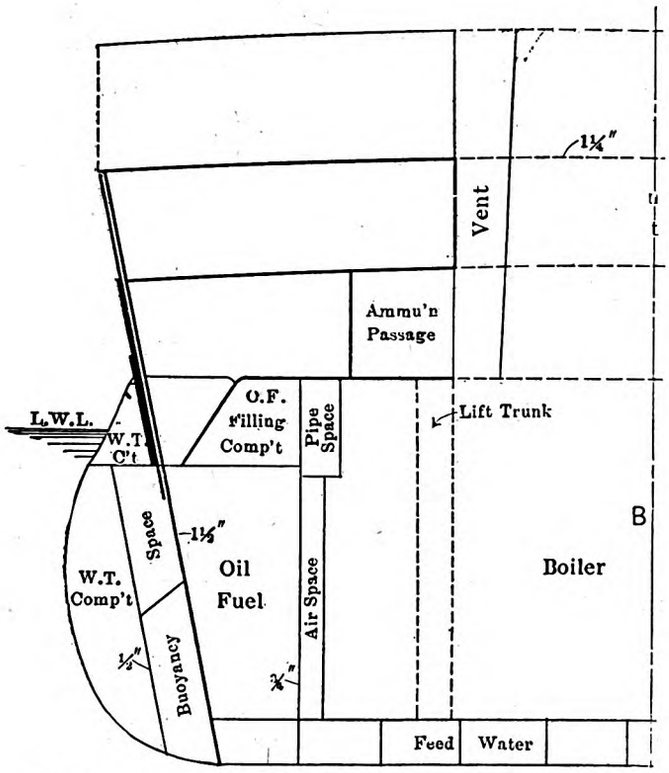



**Fig. 27.—Section of Naval Capital Ship, Showing Bulge**

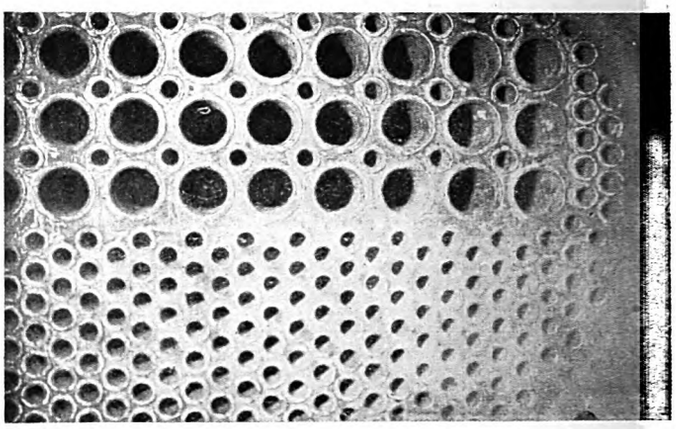


Fig. 29.—Boiler Tubes and Flues Welded to Tube Sheet

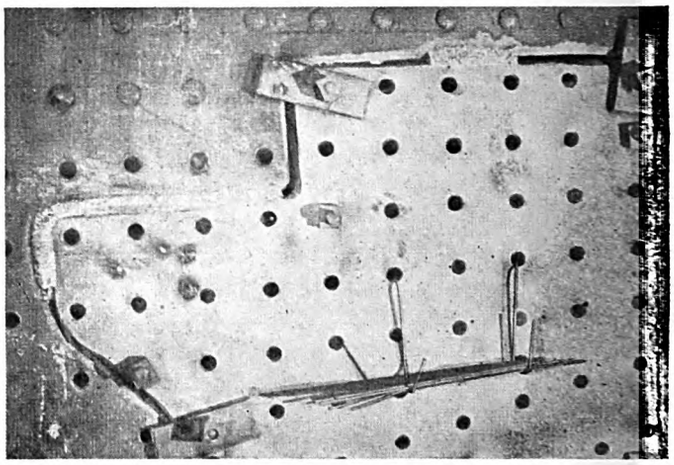


Fig. 30.—Setting Patch in Firebox Flush

tight by calking. All the work performed on this boat has proved entirely satisfactory to the owner of the vessel.

### Electric Welded Caisson

Another very interesting construction where electric welding was used for practically all joints was the steel self-floating caisson for the 460 foot dry dock at Hikoshuma Dockyard. Brackets for frames and beams were butt welded. The hold stringer plates were tack welded to the shell and frame and web frames butt riveted to the beams. Deck stringers were fastened in the same way as the hold stringer except where watertightness was called for, in which case, angle bar connections were used to the shell with the seams

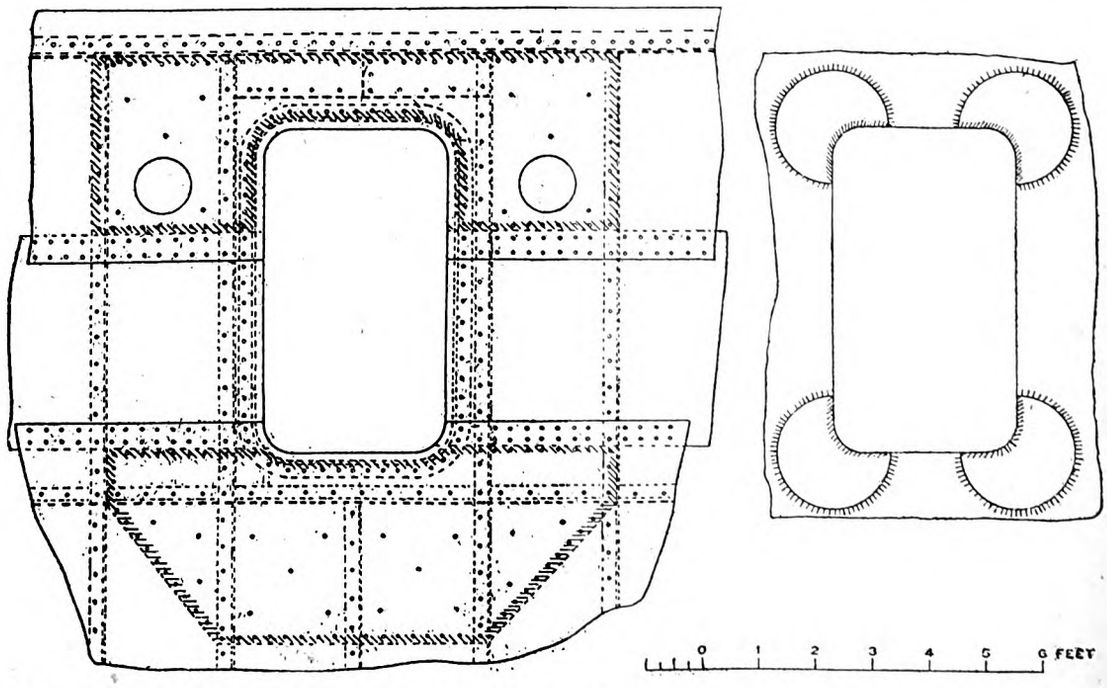



**Fig. 28.—Doubling Plate in Way of Opening in Ship's Side on a Riveted Vessel and an Approved Method of Compensating for a Similar Opening by Welded Doubling Pieces**

Generated on 2024-09-12 16:48 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

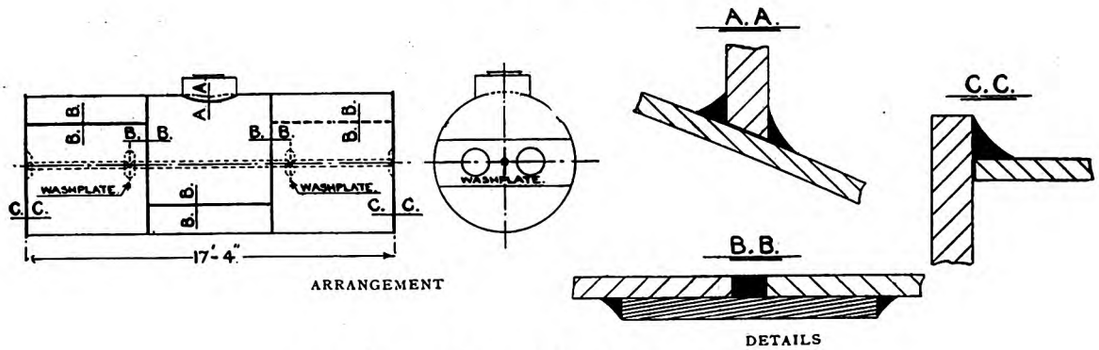



Fig. 31.—Details of Welding for Oil Fuel Tanks

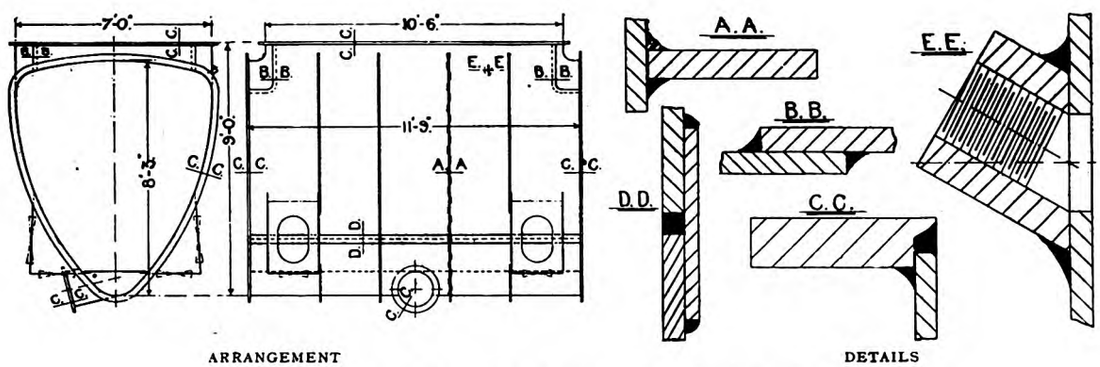



Fig. 32.—Arrangement and Details of Welded Condenser

and butts welded. In order to facilitate laying of the wood deck, all plating was butt welded leaving a flush deck. Bulkhead plating was fitted horizontally and it was lapped and full welded on the upper edge with tack welding on the lower edge. Bounding bars were full welded to the bulkheads but riveted to the shell. Trunks were plated vertically with corners and the butts were welded. All anglesmith work was practically omitted by the use of angles having corners cut out and welded either with or without filling in the corner of the cut flange. Doubling plates around manholes and other stressed places were full welded along the edges with no holes for rivets. Floating plates and diaphragm plates were welded direct without the use of angles. All rail stanchion sockets, steps, eye pads and similar fittings were placed in position and tack welded. Fastening bolts for wood fenders were welded to the shell plating without penetrating the shell. All welded laps of plating were the width of a single riveted lap.

The report from the Dockyard is to the effect that the

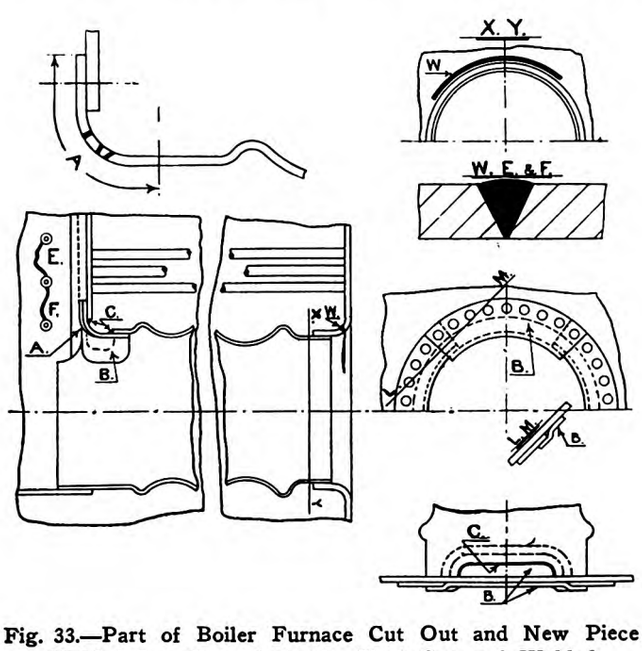



Fig. 33.—Part of Boiler Furnace Cut Out and New Piece Welded In. Several Cracks V-ed Out and Welded

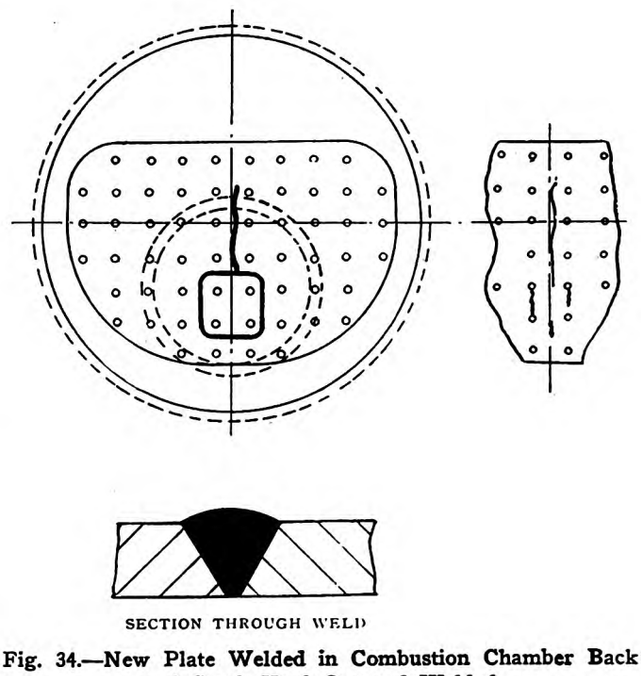



Fig. 34.—New Plate Welded in Combustion Chamber Back and Crack V-ed Out and Welded

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

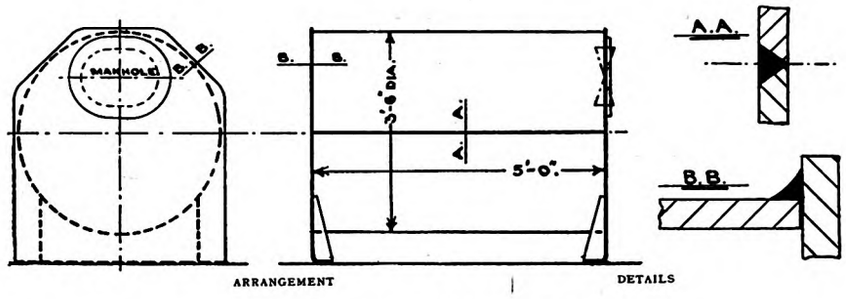



Fig. 35.—Water Storage Tank

"caisson is working very well without giving any trouble at all."

### WELDED PONTOON FOR CRANE

The Kobe plant has constructed an all electric welded floating crane pontoon 65 feet long, 35 feet molded breadth, and 8 feet molded depth, having a rectangular form in cross sections and deck plan with the bottom plating at both ends curving upwards with a 30-inch radius. The plating is 5/16 to ¼ inch thick, all joints being butt welded. Plating is stiffened by flat bar frames 3½ inches by ⅜ inch spaced

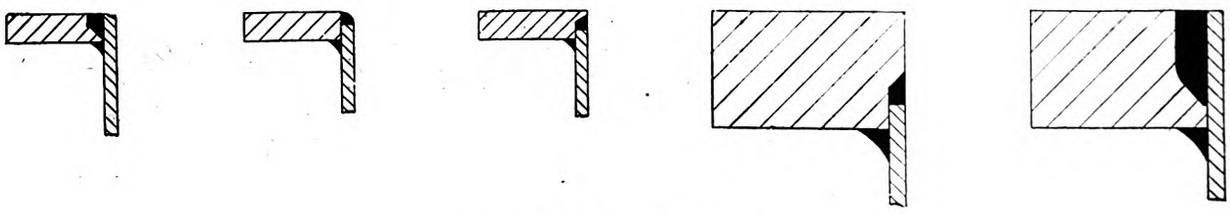


Fig. 36.—Flanges for Pipes

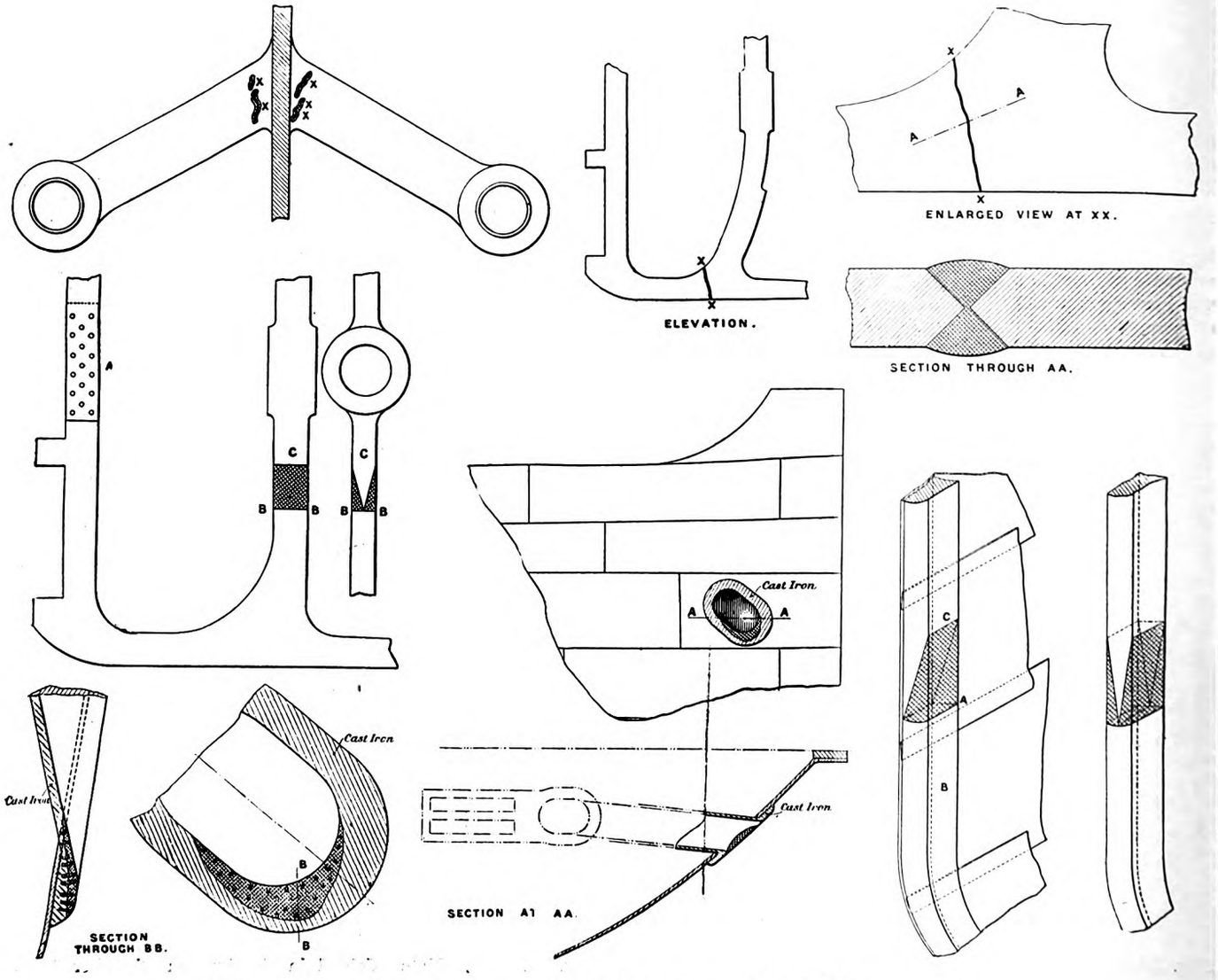



Fig. 37.—Examples of Electric Arc Work in Shipbuilding

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

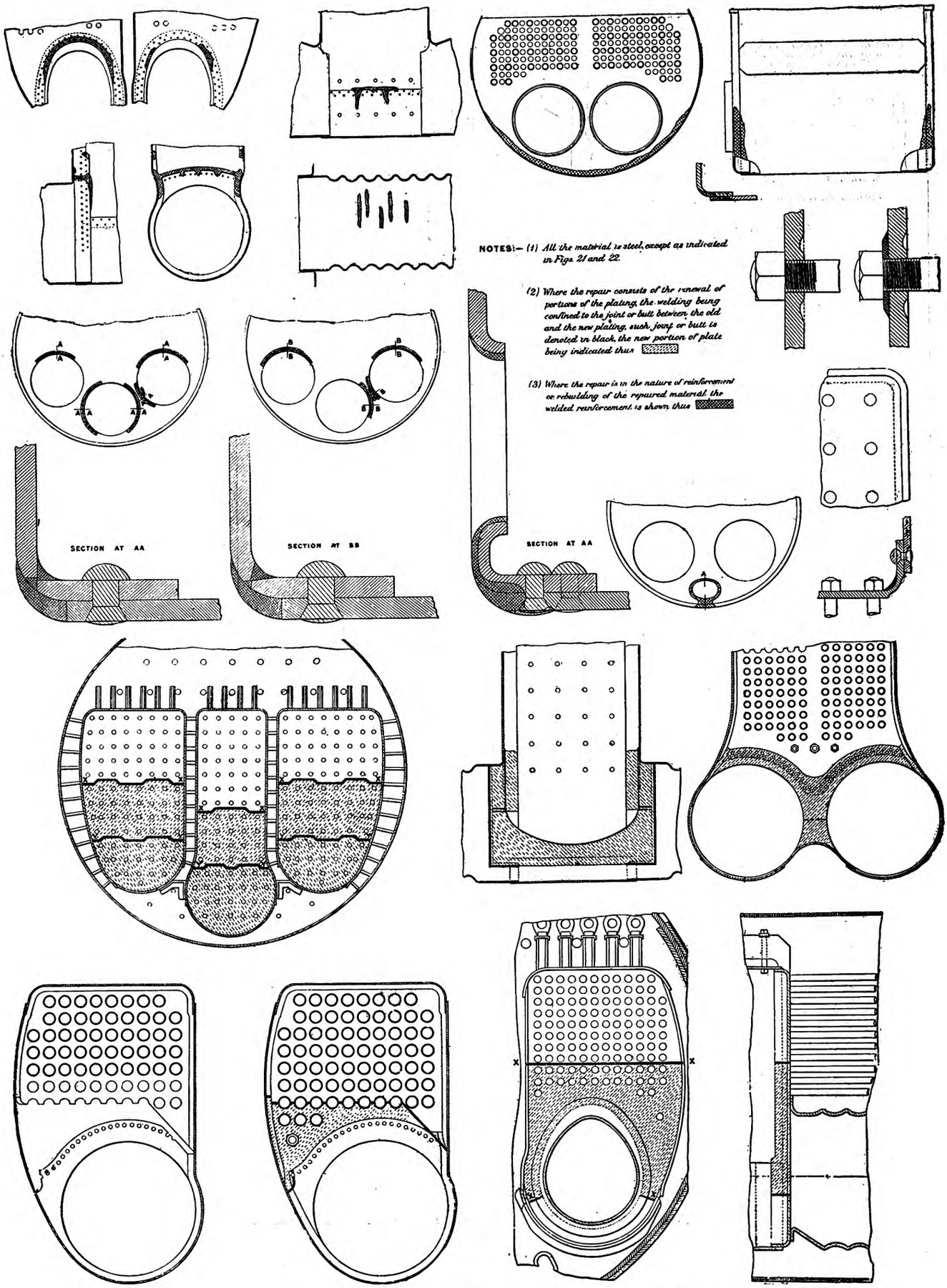

NOTES:— (1) All the material is steel, except as indicated in Figs. 21 and 22.
(2) Where the repair consists of the renewal of portions of the plating, the welding being confined to the joint or butt between the old and the new plating, such joint or butt is denoted in black, the new portion of plate being indicated thus
(3) Where the repair is in the nature of reinforcement or rebuilding of the required material, the welded reinforcement is shown thus
SECTION AT AA
SECTION AT BB
SECTION AT AA

**Fig. 38.—Examples of Electric Arc Welding in Boiler Work**

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

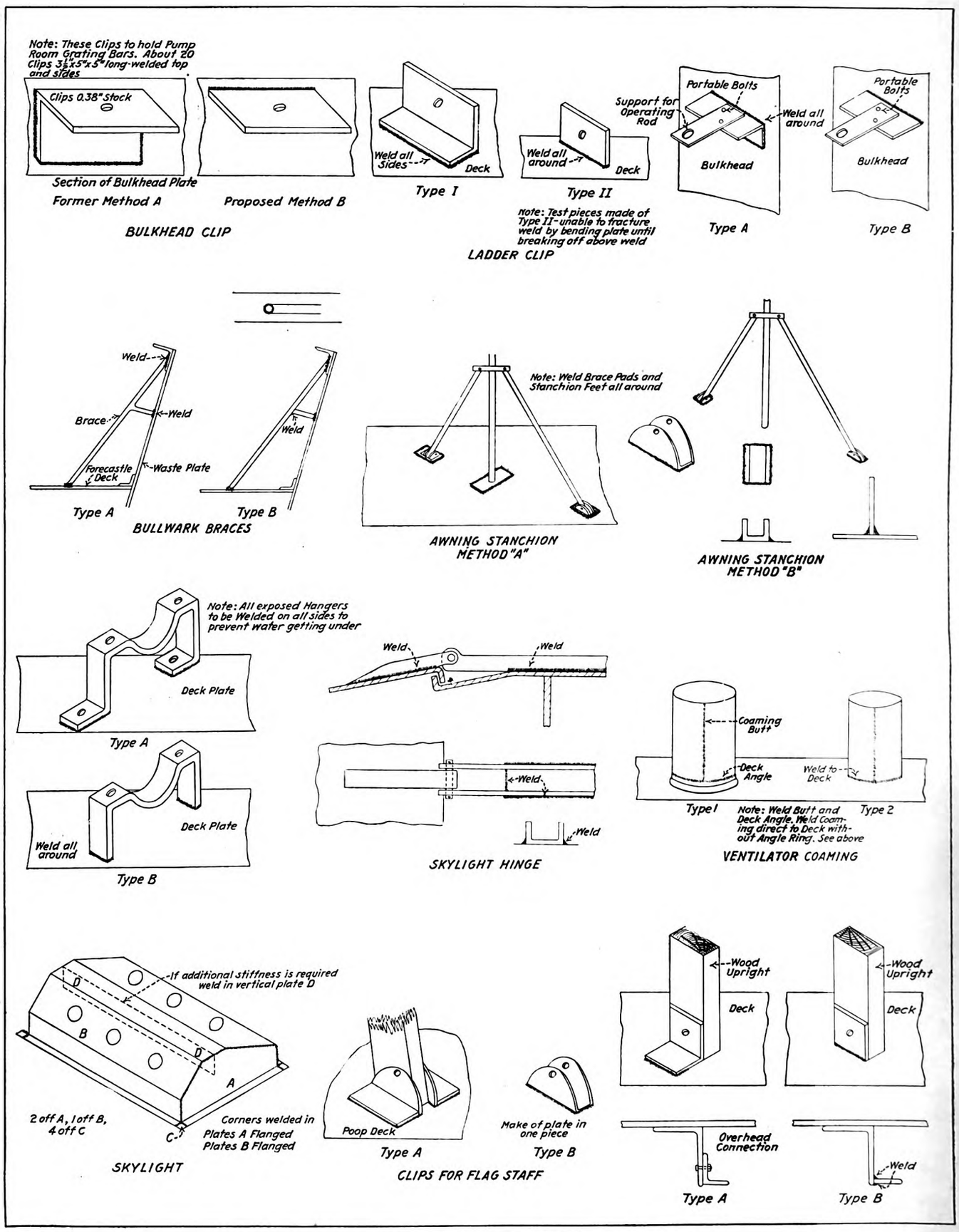



**Fig. 39.—Applications of Arc Welding to Ship Construction**

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

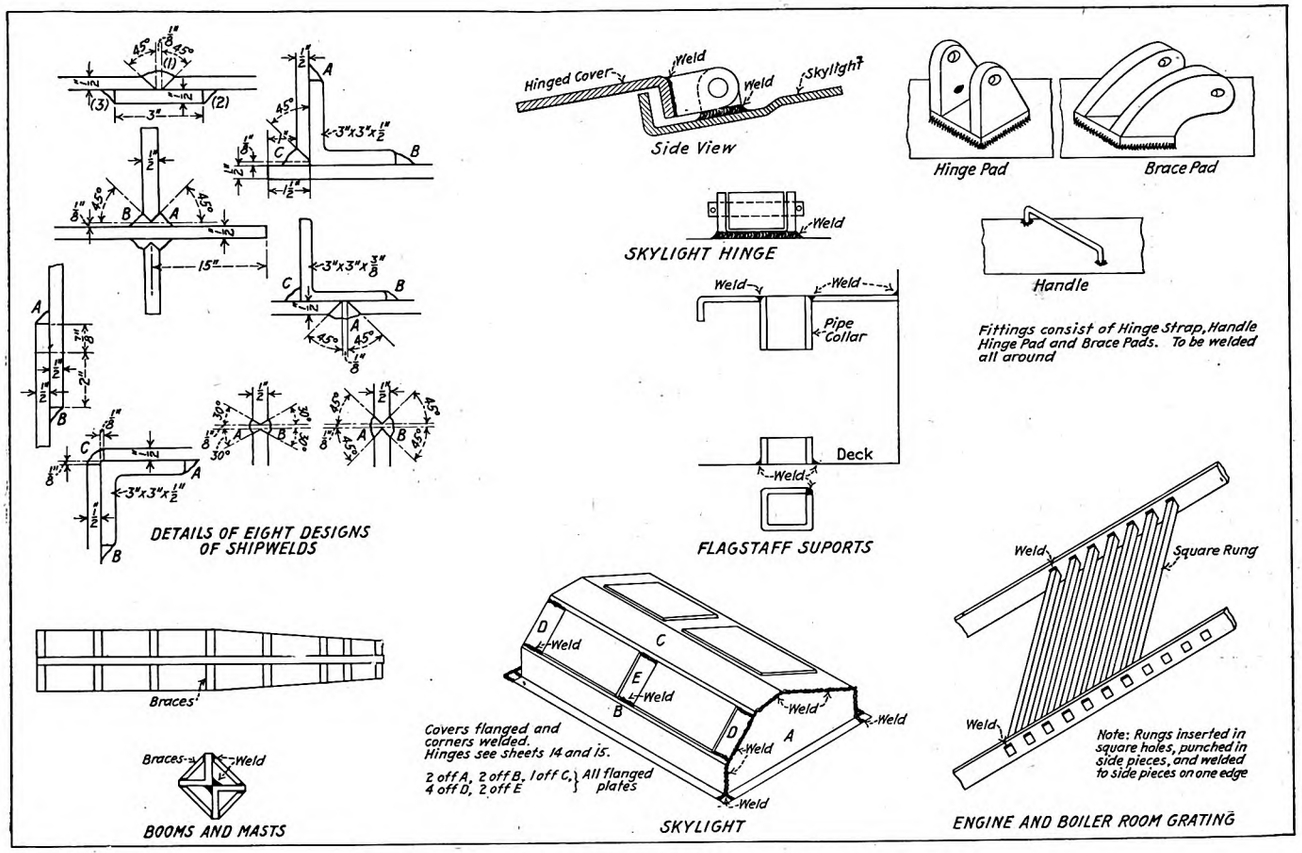

DETAILS OF EIGHT DESIGNS OF SHIPWELDS
Hinged Cover
Weld
Skylight
Side View
SKYLIGHT HINGE
Hinge Pad
Brace Pad
Handle
Fittings consist of Hinge Strap, Handle Hinge Pad and Brace Pads. To be welded all around
Pipe Collar
Deck
FLAGSTAFF SUPORTS
Square Rung
Braces
BOOMS AND MASTS
Covers flanged and corners welded. Hinges see sheets 14 and 15.
2 off A, 2 off B, 1 off C, 4 off D, 2 off E } All flanged plates
SKYLIGHT
Note: Rungs inserted in square holes, punched in side pieces, and welded to side pieces on one edge
ENGINE AND BOILER ROOM GRATING

Fig. 40.—Applications of Arc Welding to Ship Construction

30 inches apart, and tack welded to the plating. Fore and aft as well as athwartship bulkheads are used for additional stiffening. Insofar as possible, overhead welding was avoided by building up large sections on the ground, and

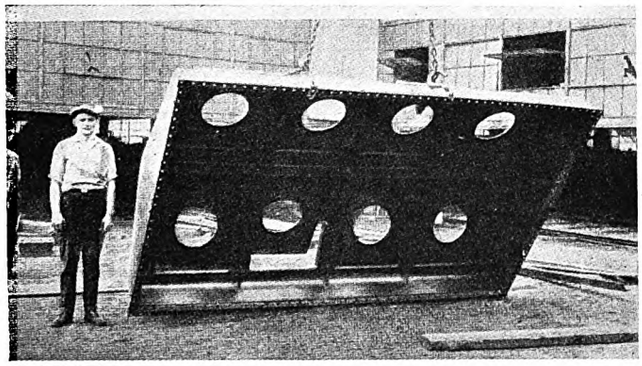


Fig. 41.—Interior of Welded Engine Room Skylight

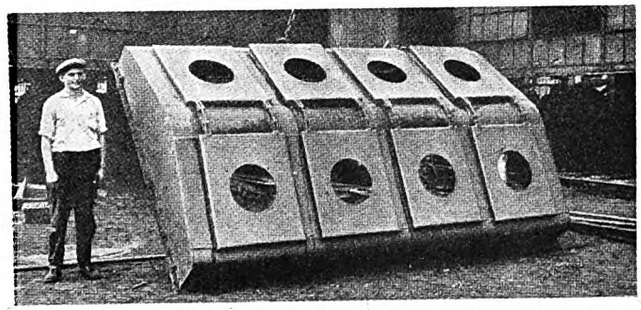


Fig. 42.—Exterior of Welded Engine Room Skylight

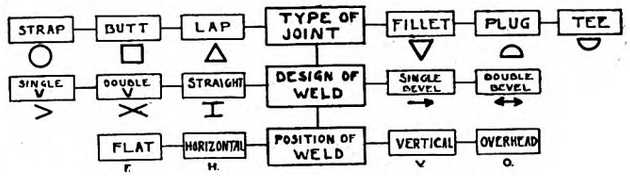



Fig. 43.—System of Designating Types of Welds

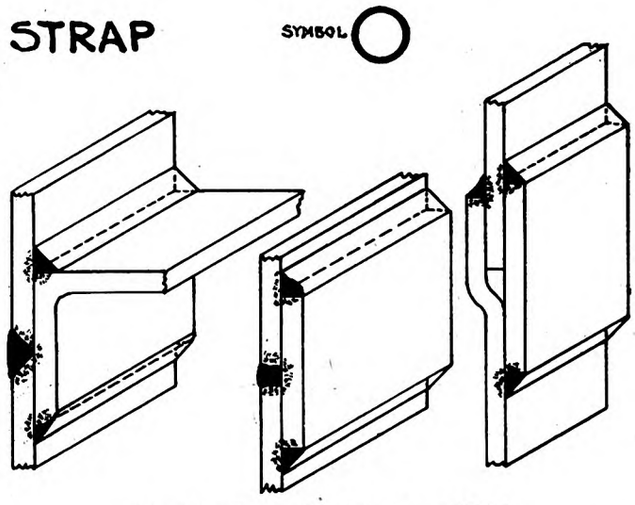



Fig. 44.—Type of Joint: Strap Weld

A strap weld is one in which the seam of two adjoining plates or surfaces is reinforced by any form or shape to add strength and stability to the joint or plate. In this form of weld the seam can only be welded from the side of the work opposite the reinforcement, and the reinforcement of whatever shape must be welded from the side of the work to which the reinforcement is applied.

Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

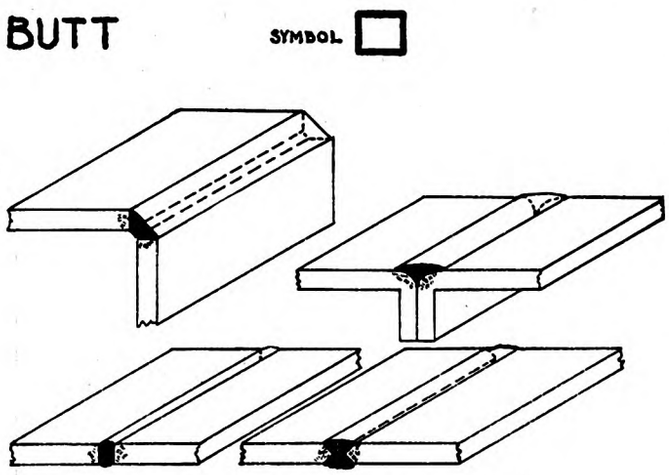



Fig. 45.—Type of Joint: Butt Weld

A butt weld is one in which two plates or surfaces are brought together edge to edge and welded along the seam thus formed. The two plates, when so welded, form a perfectly flat plane in themselves excluding the possible projective caused by other individual objects as frames, straps, stiffeners, etc., or the building up of the weld proper.

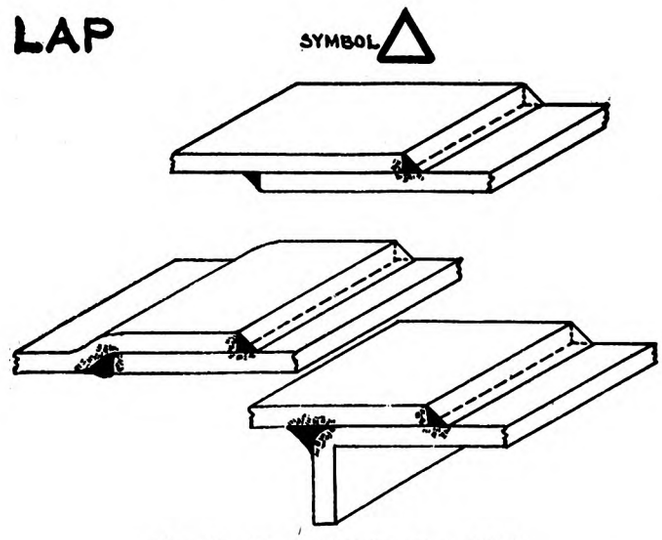



Fig. 46.—Type of Joint: Lap Weld

A lap weld is one in which the edges of two plates are set one above the other and the welding material so applied as to bind the edge of one plate to the face of the other plate. In this form of weld the seam or lap forms a raised surface along its entire extent.

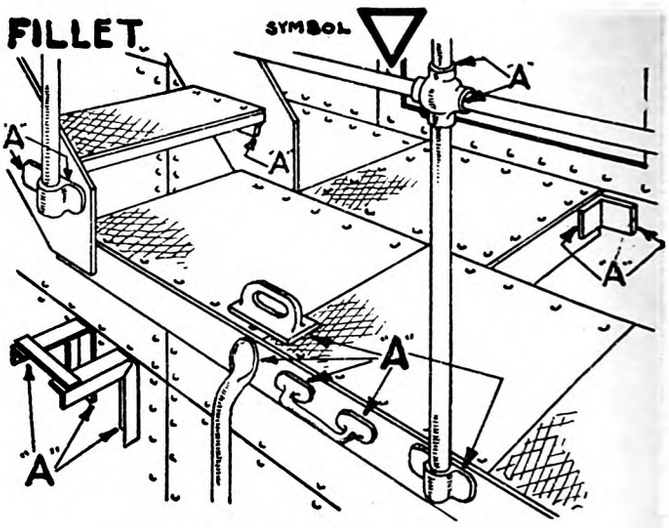



Fig. 47.—Type of Joint: Fillet Weld

A fillet weld is one in which some fixture or member is welded to the face of a plate, by welding along the vertical edge of the fixture or member (see "welds" shown and marked "A" on illustration). The welding material is applied in the corner thus formed and finished at an angle of 45 degrees to the plate.

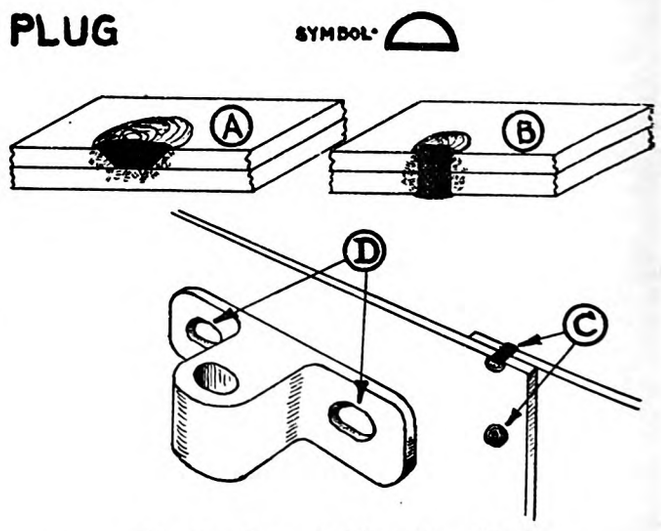



Fig. 48.—Type of Joint: Plug Weld

A plug weld is one used to connect the metals by welding through a hole in either one plate (Fig. "A") or both plates (Fig. "B"). Also used for filling through a bolt hole as at (Fig. "C"), or for added strength when fastening fixtures to the face of a plate by drilling a countersunk hole through the fixture (Fig. "D") and applying the welding material through this hole, as at (Fig. "D"), thereby fastening the fixture to the plate at this point.

then erecting. Mention is made of their difficulty to entirely avoid buckling of the light plates but that a coppersmith's skill of judging where cuts should be made to relieve stresses enabled them to eliminate these buckles and leave a smooth finished job.

Many other ships, all or partially welded, could be mentioned here, such as the 52-foot barge built by the S.O.S Welding Corporation of Brooklyn, N. Y., or the 172-foot battle towing target constructed at the Norfolk Navy Yard, but we believe the data given will be sufficient to form a proper background to build on.

The use of electric arc welding in ship construction, aside from joining what is known as main strength members, such as shell and deck plating, keelsons, stringers, main bulkheads, etc., is very extensive and shipbuilders are familiar with such work, at least, to a limited extent.

### Machinery Repairs on ex-German Liners

One of the most spectacular electric arc welding jobs was the repair of the main propulsion machinery on the German ships taken over by our Government when war was declared on Germany. The machinery had been demolished by the crews of the ships with the hope, at least, of preventing their immediate use, and it was in general the opinion of our engineers estimating on the repairs that it would require about twelve months' time to put the machinery in service. However, under the direction of the late D. H. Wilson of the Wilson Welding and Metal Company, repairs to the various castings were accomplished by the use of electric arc welding.

After the broken out parts were cut out and edges cleaned, steel studs were fitted on the edges of the original castings and broken out parts were replaced by steel castings with edges so beveled to form a V in the original castings, and these V's were filled in with welding material. Then welding was continued from the edge of the inserted pieces to the studs previously referred to; in this way reinforcement was obtained of sufficient strength to withstand the stresses to which these parts are exposed. Due to this method of repairs the former German ships were again in service only a few

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

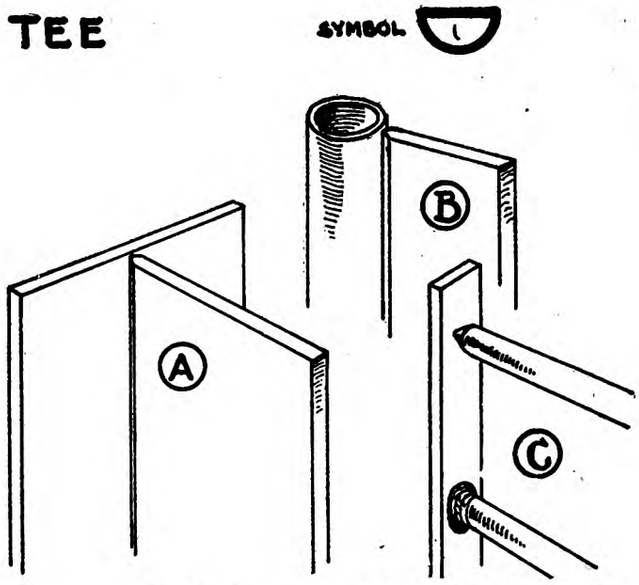



Fig. 49.—Type of Joint: Tee Weld

A tee weld is one where one plate is welded vertically to another as in the case of the edge of a transverse bulkhead (Fig. "A") being welded against the shell plating or deck. This is a weld which in all cases requires exceptional care, and can only be used where it is possible to work from both sides of the vertical plate. Also used for welding a rod in a vertical position to a flat surface, as the rung of a ladder (Fig. "C"), or a plate welded vertically to a pipe stanchion (Fig. "B"), as in the case of water closet stalls.

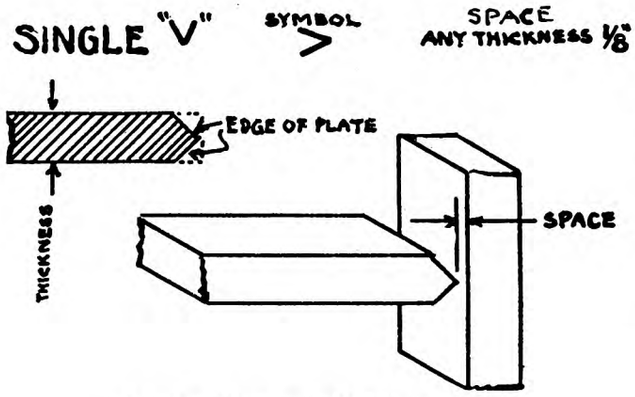



Fig. 50.—Design of Weld: Single "V"

Single "V" is a term applied to the "edge finish" of a plate when this edge is beveled from both sides to an angle, the degrees of which are left to the designer. To be used when the "V" side of the plate is to be a maximum "strength" weld, with the plate setting vertically to the face of an adjoining member, and only when the electrode can be applied from both sides of the work.

months after they had been taken over by the Government.

The submarine activities prompted the British Government to fit bulges of steel construction on the outside of the shell plating at and below the water line on a large number of capital Navy ships, and these structures were to a large extent constructed by the use of the Quasi-Arc welding system.

A book could be written on the many important jobs performed during the Great War by the use of electric arc welding. Yet much more could have been accomplished had it been possible to compare data on work performed in the various shipyards as was later found by comparing work done by electric arc welding in the San Francisco plant of the Bethlehem Shipbuilding Corporation, under the guidance of Mr. J. J. Tynan, and work performed by the same company at the Fore River plant through the activities of the general manager, Mr. W. S. Wakeman. Reports and photoprints of work performed at the various shipbuilding and

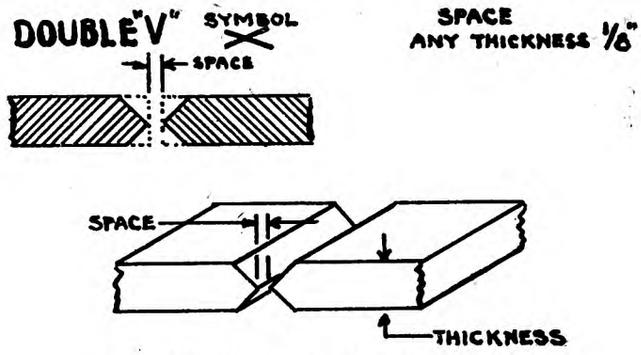



Fig. 51.—Design of Weld: Double "V"

Double "V" is a term applied to the "edge finish" of two adjoining plates when the adjoining edges of both plates are beveled from both sides to an angle, the degrees of which are left to the designer. To be used when the two plates are to be "butted" together along these two sides for a maximum "strength" weld. Only to be used when welding can be performed from both sides of the plate.

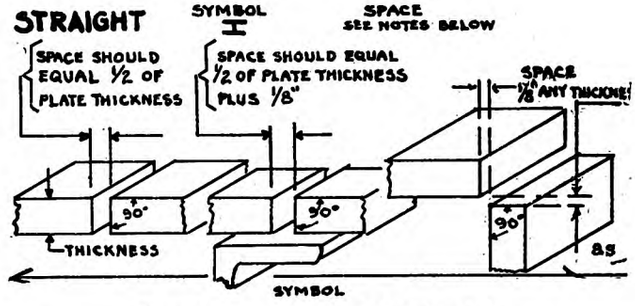



Fig. 52.—Design of Weld: Straight

Straight is a term applied to the "edge finish" of a plate, when this edge is left in its crude or sheared state. To be used only where maximum strength is not essential, or unless used in connection with strap, stiffener or frame, or where it is impossible otherwise to finish the edge. Also to be used for a "strength" weld, when edges of two plates set vertically to each other—as the edge of a box.

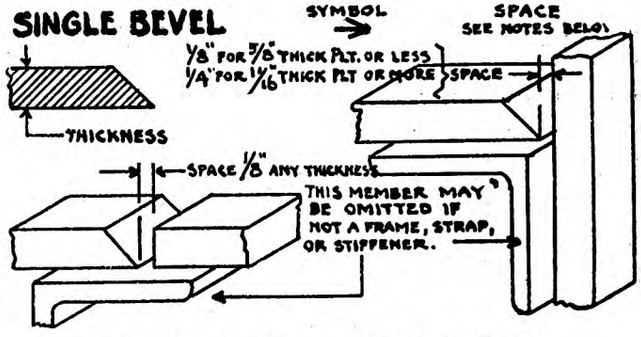



Fig. 53.—Design of Weld: Single Bevel

Single bevel is a term applied to the edge finish of a plate, when this edge is beveled from one side only to an angle, the degrees of which are left to the designer. To be used for "strength" welding, when the electrode can be applied from one side of the plate only, or where it is impossible to finish the adjoining welding surface.

ship repair plants as well as from the welding equipment manufacturers show a wonderful opportunity for this simple method of construction, and the illustrations embodied in this paper give a general idea of what can be accomplished.

### SHIP REPAIR WORK

In ship repair activities there is an unlimited field for the use of electric arc welding and work has been performed by welding that would have been impractical without it.

Converting a coal burning ship to an oil burning ship and fitting and making oil tight compartments for carrying the fuel oil is an extremely costly and difficult undertaking should

Generated on 2024-09-12 16:52 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

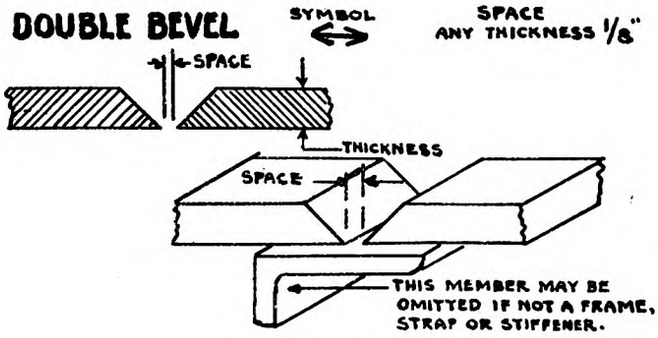



Fig. 54.—Design of Weld: Double Bevel

Double bevel is a term applied to the edge finish of two adjoining plates, when the adjoining edges of both plates are beveled from one side only to an angle, the degrees of which are left to the designer. To be used where maximum strength is required, and where electrode can be applied from one side of the work only.

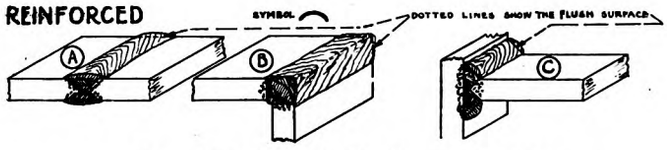



Fig. 55.—Type of Weld: Reinforced

Reinforced is a term applied to a weld when the top layer of the welding material is built up above the plane of the surrounding material as at Fig. "A" or Fig. "B" above, or when used for a corner as in Fig. "C." The top of final layer should project above a plane of 45 degrees to the adjoining material. This 45 degrees line is shown "dotted" in Fig. "C" above. This type is chiefly used in a "Strength" or "Composite" kind of weld for the purpose of obtaining the maximum strength efficiency, and should be specified by the designer, together with a minimum number of layers of welding material.

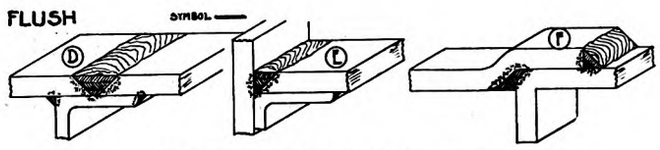



Fig. 56.—Type of Weld: Flush

Flush is a term applied to a weld when the top layer is finished perfectly flat or on the same plane as on the adjoining material as shown at Figs. "D" and "E" above or at an angle of 45 degrees when used to connect two surfaces at an angle to each other as at Fig. "F" above. This type of weld is to be used where a maximum tensile strength is not all important and must be specified by the designer, together with a minimum number of layers of welding material.

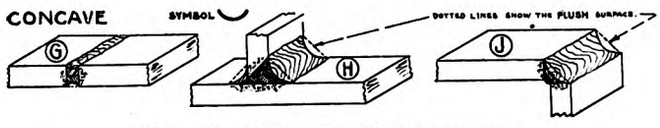



Fig. 57.—Type of Weld: Concave

Concave is a term applied to a weld when the top layer finishes below the plane of the surrounding material as at Fig. "G" above, or beneath a plane of 45 degrees at an angular connection as at Figs. "H" and "J" above.

To be used as a weld of no further importance than filling in a seam or opening, or for strictly calking purposes, when it is found that a minimum amount of welding material will suffice to sustain a specified pound square inch pressure without leakage. In this "type of weld" it will not be necessary for the designer ordinarily to specify the number of layers of material owing to the lack of structural importance.

we have to rely on riveting and calking alone, but such conversions are relatively simple today with the use of electric arc welding as was clearly demonstrated when Messrs. Armstrong, Whitworth and Company converted the Cunard company's great passenger ship *Aquitania* from coal to an oil burner.

To cut out by gas a damaged part of a ship, fit new parts or repair the parts cut out and then by welding restore it to its former place, retaining the original strength, is just what is done today by the use of electric arc welding and shipowners are able to obtain more operating days due to cutting down the lay days necessary for repairs, by the use

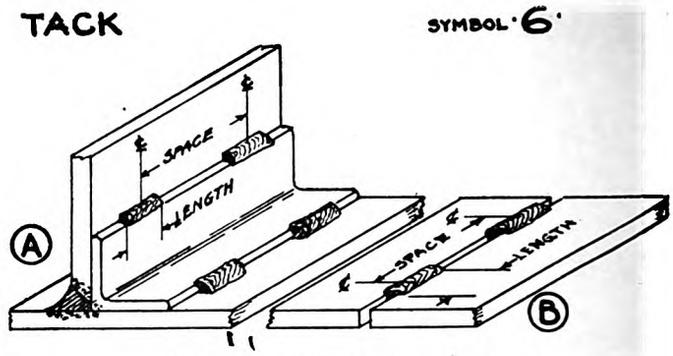



Fig. 58.—Kind of Weld: Tack

A tack weld is applying the welding material in small sections to hold two edges together, and should always be specified by giving the space from center to center of weld and the length of the weld itself. No particular "design of weld" is necessary of consideration. A tack is also used for temporarily holding material in place that is to be solidly welded, until the proper alinement and position is obtained, and in this case, neither the length, space or design of weld are to be specified.

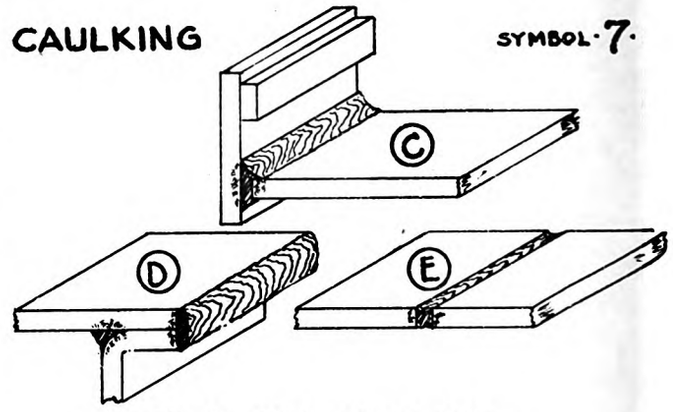



Fig. 59.—Kind of Weld: Calking

A calking weld is one in which the density of the crystalline metal, used to close up the seam or opening, is such, that no possible leakage is visible under a water, oil or air pressure of 25 pounds per square inch. The ultimate strength of a calking weld is not of material importance—neither is the "design of weld" of this kind necessary of consideration. The operator must be the judge in the number of layers needed for a tight weld, although the designer should specify a minimum amount of layers.

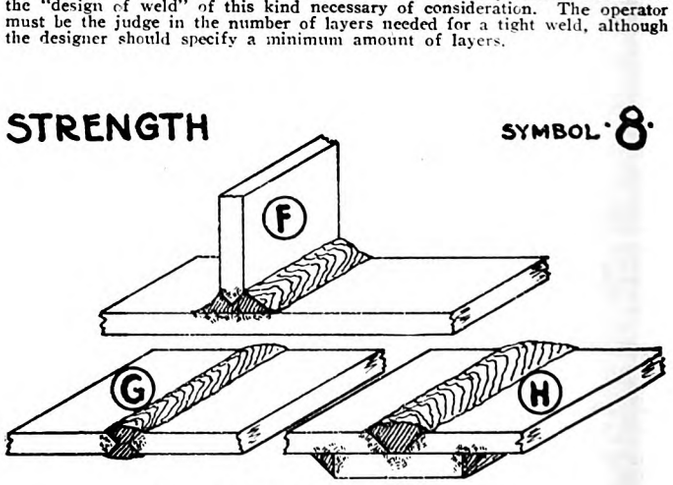



Fig. 60.—Kind of Weld: Strength

A strength weld is one in which the sectional area of the welding material must be so considered that its tensile strength and elongation per square inch must be equal at least 80 percent of the ultimate strength per square inch of the surrounding material. (To be determined and specified by the designer). The welding material can be applied in any number of layers beyond a minimum specified by the designer. The density of the crystalline metals is not of vital importance. In this form of weld, the "design of weld" must be specified by the designer and followed by the operator.

of electric arc welding. Many of the cuts and prints shown herein are of work designed for riveting, with welding substituted, while there are other cuts designed for welding, and it is by the use of the proper design that electric welding

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

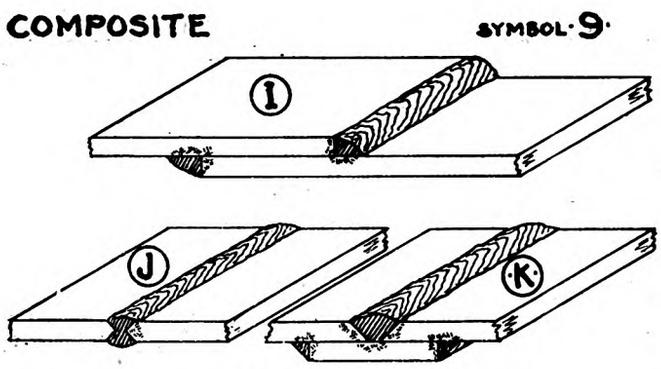



Fig. 61.—Kind of Weld: Composite

A composite weld is one in which both the strength and density are of the most vital importance. The strength must be at least as specified for a "strength weld," and the density must meet the requirements of a "calking weld" both as above defined. The minimum number of layers of welding material must always be specified by the designer, but the welder must be in a position to know if this number must be increased according to the welder's working conditions.

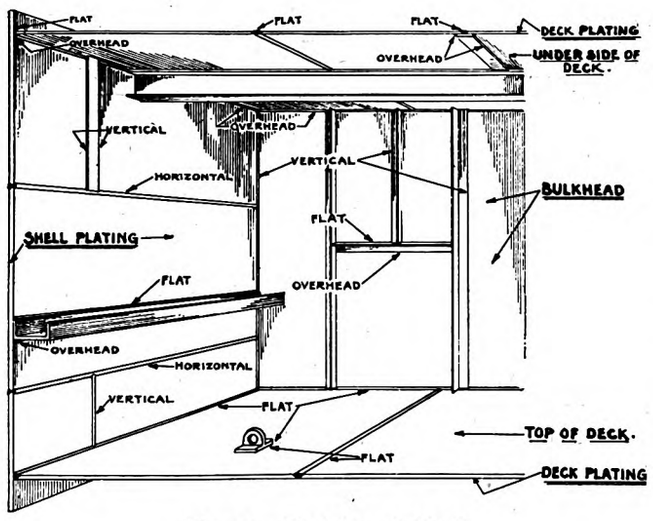



Fig. 62.—Position of Weld

Flat position is determined when the welding material is applied to a surface on the same plane as the deck, allowing the electrode to be held in an upright or vertical position. The welding surface may be entirely on a plane with the deck, or one side may be vertical to the deck and welded to an adjoining member that is on a plane with the deck.

Horizontal position is determined when the welding material is applied to a seam or opening, the plane of which is vertical to the deck and the line of weld is parallel with the deck, allowing the electrode to be held in an inboard or outboard position.

Vertical position is determined when the welding material is applied to a surface or seam, whose line extends in a direction from one deck to the deck above, regardless of whether the adjoining members are on a single plane or at an angle to each other. In this position of weld, the electrode would also be held in a partially horizontal position to the work.

Overhead position is determined when the welding material is applied from the under side of any member whose plane is parallel to the deck and necessitates the electrode being held in a downright or inverted position.

construction will be found stronger and cheaper as well as less in weight as compared with a riveted construction.

In order to simplify the work of designating types of welds on plans in the designing of detail parts, there has been developed by Mr. H. E. Knox, ex-naval constructor, a system of marking of joints for various types of welding, and it is hoped that such a system will be followed in the making of plans of ships or other structures to be constructed by the electric arc welding process.

*(To be continued)*

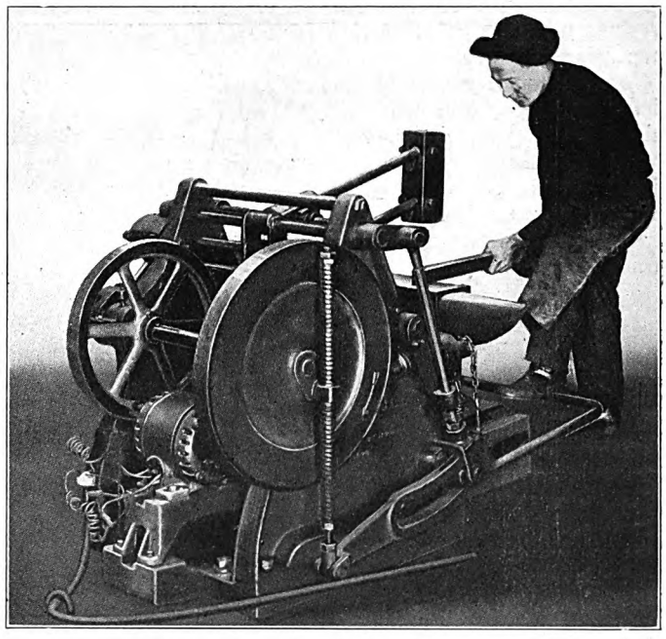
---

During June Shipping Board steamers carried 63 percent of the cotton shipped from Gulf ports to foreign countries. The Shipping Board is now operating frequent sailings from Gulf ports to Continental Europe, United Kingdom, Mediterranean, Orient and Africa.

## General Utility Power Smithing Hammer

A POWER-DRIVEN hammer intended particularly for use on forging work ordinarily performed under hand-swung sledges and too small to be done under steam hammers, is shown in the accompanying illustration. The hammer is termed a "mechanical helper," since it replaces the one or two men employed as strikers at each anvil. The same hand tools that the smith ordinarily employs are used with the hammer, without the need of special tools and dies. The hammer, which is stated to greatly increase the capacity and the output per anvil, has recently been placed on the American market by the Blacker Engineering Co., Inc., Grand Central Terminal, New York, N. Y.

The machine is rated to handle material up to 2½ inches thick, although even larger sizes can be cared for. The hammer itself is under the control of the smith, so that either a light or heavy blow can be struck. The force of the blow varies directly with the depression of the treadle extending around the anvil. It is stated that the maximum blow is about four times as heavy as that delivered by a human



**Power Hammer for Forging Work**

striker, and that the machine attains a rate of 140 blows per minute.

An important feature of the hammer is the lateral traverse motion that can be given to the hammer itself. This motion is controlled by a winged foot lever located at the right of the anvil and enabling the head to be traveled along the face of the anvil to the desired point.

An anvil and a block of special design to suit the hammer are furnished. The base of the anvil is planed and adjusting screws are provided on the stand, to enable the anvil to be moved forward or backward to get the proper position under the hammer.

The hammer requires only 1 horsepower to drive it. It can be run by means of a belt from a lineshaft, being furnished with tight and loose pulleys 15 inches in diameter for this work. A more compact unit is the one driven by an individual motor, as illustrated. The motor is mounted on a small stand on the base and geared to a large driving gear placed on the main shaft. The hammer alone weighs 1,300 pounds, the anvil 560 pounds, and the stand 336 pounds.

Generated on 2024-09-12 16:47 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Competition for Ship Repair Contracts Keen Between British and Continental Shipyards

## Labor Difficulties Hamper Work in the United Kingdom—Repair Costs from 10 to 36 Percent Lower on the Continent

**By W. H. Wendon**

WITH the possible improvement in the general shipping position from now onwards—the middle months of the year are notoriously poor ones for shipowners—attention is being paid to the question of ship repairs, an elastic term which includes damage owing to weather or other "casualty," survey commitments, or so on. In this connection the long-standing competition between United Kingdom and Continental ship repairers is again prominently to the fore. The fact is that, while the United Kingdom has recovered to a marked degree the work which, owing to lower costs in consequence of exchange difficulties, etc., Continental yards had been able to wrest from them, the position is still serious from the point of view of the United Kingdom ship repairing industry.

Apart from the rate of exchange, which is a fluctuating handicap, labor difficulties are the chief source of worry at the moment. The boiler makers, following on the attitude which resulted in the employers having no option but to lock them out, have been responsible for serious delay in repairing boats in the United Kingdom, with the consequence that vessels are constantly diverted to near-by Continental yards.

### Comparative Costs of Repair Work

Many instances have just come to light showing the extraordinary disparity between United Kingdom and Continental costs of repairs and periods in which the work can be performed. One of the most interesting is that of the S. S. *Spero,* a boat of 1,960 tons gross, which was damaged, and tenders for the repair of which were invited on account of the underwriters from two German firms, four Dutch firms, one Belgian firm and thirty-one British firms. The tender to specification of a German firm amounted to £17,500, the lowest Dutch tender was £19,500 and the highest £27,000, while the British tenders ranged from £25,800 to £34,500. The underwriters found the difference of £8,300 between the lowest British and German tenders more than their business instinct would stand, and awarded the contract to the German firm.

The placing of the work with a German firm instead of a British one had a most unexpected result. The owners of the *Spero,* the Pelton Steamship Company, of Newcastle-on-Tyne, were indignant that an ex-enemy firm should receive the contract and announced their intention of resisting the underwriters' action in placing the contract with Germans. While nothing more has been heard in regard to this unusual attitude, the incident has served to open up the whole question of repairs as affecting owners, repairers and underwriters.

A leading Lloyd's man gives an instance of the low Continental charges as compared with those quoted by British ship repairers. He states that, when tenders were called for by underwriters for the repairing of a steamer which stranded, nine tenders were received from British firms and two from abroad. The British offers were, with one exception, subject to the cessation of the boiler makers' lockout, and the time required for the work was between 48 and 60 working days. On the other hand, the two foreign competitors offered to do the work in 32 and 28 days respectively, at prices approximately 10 percent less than the most favorable, and 36 percent less than the highest, British tender.

### British Employees Object to Overtime Work

One of the main factors in the trouble is that employees in the United Kingdom cannot be induced to work overtime, their main plea being that this policy would add to the ranks of the unemployed. It is pointed out to them, however, that when, owing to their action, work is diverted abroad, this entails a dead loss to this country, and it is believed that they are gradually seeing the force of this argument. Overtime is engaged in to an enormous extent in Continental yards, thus facilitating in the competition with British and other "foreigners." There is another aspect, however, and that is that, while the Continental yards are, as I have indicated, still securing many contracts which, other conditions being equal, would find their way to United Kingdom plants, some of the prices which are being accepted abroad are such as to leave little, if any, margin for profit, so that the question arises: How long will these Continental repairers be prepared to carry on without making a reasonable profit?

Take, for example, one of the leading Dutch plants, Wilton's Engineering and Slipway Company. The directors of this concern remark that "contracts for repair work can only be secured in competition with British firms, and the prices which the company has been forced to accept have been absolutely unprofitable." During the last financial year the company docked 367 ships, of 1,630,482 tons, while 45 ships, of 138,877 tons, were overhauled in the corporation dry docks. But, most important of all, the company was unable to pay a dividend on its ordinary shares.

The United Kingdom interests concerned are not unnaturally endeavoring to find a way out of the problem to their mutual advantage, and in this regard one prominent ship repairer emphasizes that "the British shipping industry is a trinity of factors that must support each other—the shipowner, the shipbuilder and the ship repairer—in all circumstances and difficulties." This point has, of course, been made many times before, but there is still every absence of sign that the interests indicated intend to work in any close harmony. They would seem, on the surface, to treat each other's interests as antagonistic to their own. Or is it merely apathy?

### Value of Steamship Tonnage

A guide, though rather an indirect one, has been afforded to the value of steamship tonnage by the sale by auction in London of seven Chinese-built "standard" steamers. Six of the boats were offered at one time and the other on a separate occasion. In the result, an average price of about £5 per ton on the deadweight was realized, against £36 per ton paid for the boats about four years ago while under construction. In drawing deductions from the result of this shipping sale it should be noted that the prejudice against boats of Chinese construction is understood to be reflected in the price to the extent of a depreciation of 5 or 10 percent as compared with the price of British-built vessels.



Generated on 2024-09-12 16:54 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

### TRADE FACILITIES ACTS GUARANTEE

The guarantee, under the Trade Facilities Acts, to the Royal Mail Steam Packet Company, of a sum not exceeding £2,300,000 for expenditure in the United Kingdom on material for three ships to be built by Messrs. Harland and Wolff, Belfast, has led to the anticipated misconception in the minds of many that the guarantee is a "loan." As a matter of fact, it is nothing of the kind. The British Treasury has no power under the Trade Facilities Acts to grant loans, but only to guarantee them. The loan will be raised by the Royal Mail Company, and, to the extent to which it is guaranteed by the Treasury, will be spent by the company wholly in the United Kingdom. It is expected that the new vessels will entail an expenditure of three millions sterling, and the Government of Northern Ireland, under whose jurisdiction, of course, Belfast, where the boats are to be constructed, falls, is guaranteeing the remaining £700,000. One of the boats will be a cargo carrier of about 9,500 tons, while the others are to be passenger ships of about 20,000 tons gross, and will probably be fitted with Harland and Wolff-Burmeister and Wain Diesel engines of the new double-acting type. They are intended for the South American service.

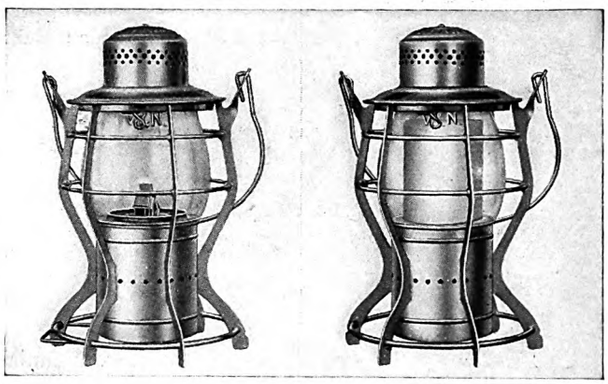
### CARRIAGE OF GOODS BY SEA BILL

The Carriage of Goods by Sea Bill, arising out of the well-known Hague Rules, is attracting enormous interest in shipping circles, both in the United Kingdom and all over the Continent. It is permissible briefly to recall that the new legislation proposes to make compulsory in certain contracts of carriage certain rules as to liability, and to make it a criminal offence to come to an agreement not in accordance with these rules. While shipowners, and traders generally, agree that some such proposal is long overdue, there is by no means unanimity as to the need for legislation to effect the purpose aimed at. Hence, the matter has been discussed at considerable length—at the annual meeting in Gothenburg of the Baltic and White Sea Conference, before the Joint Parliamentary Committee specially appointed in the United Kingdom to consider the question, and in other quarters. A leading British shipping authority, Sir Norman Hill, secretary of the Liverpool Steamship Owners' Association, giving evidence before the Parliamentary Committee, told them that the interests of the shipping trade would be best served by permitting the parties concerned to make their own contracts, without being singled out from other concerns, to carry on their business on conditions dictated by a State department. This expert contends that, as the rules regarding sea carriage have been agreed to among the commercial community, no legislation on the matter is necessary, and that, if the rules are not adopted, it will mean that no further international maritime congress can be held. Britain, he thinks, will have made a fool of herself and be laughed at by every other country. Sir Frederick Lewis, chairman of Furness, Withy and Company, endorses Sir Norman Hill's view, but holds that, if the present Bill, which with amendments "represents the greatest common measure of agreement which the business world is ever likely to reach upon this subject," can pass into law in its present form, there is every prospect that the other great maritime nations will without delay enact similar measures.

Opposition to the Rules, from quite a different angle, has been set up by Mr. Robert Temperley, the legal adviser to the Baltic and White Sea Conference. He has carefully examined the report of the Imperial Shipping Committee, and draws the conclusion that the inclusion of "tramp" ships in the scope of the Rules was entirely due to an oversight, and that only liners were readily intended to be within their operation. He agrees that for British shipowners the time for appeal has expired, they being bound in honor to support the Government in giving effect to a pledge to the Dominions. But the Governments of the Continental maritime countries are, so far as he knows untrammelled by any such pledge, and are free to exempt from this statutory control the bulk cargo trades. Mr. Temperley's arguments certainly meet with approval in some quarters, but in others the question is asked if such action by foreign Governments would be in the interests of British trade and shipping. Mr. Temperley, be it noted, is one of the three witnesses "named" by the Chamber of Shipping of the United Kingdom to give evidence before the Parliamentary Committee, so that the rather remarkable tenor of his views has occasioned more than usual surprise.

## Double Service Lantern Adapted to Marine Service

A LANTERN, combining the functions of a red and white lantern in a single unit, has been made available for marine use by the V. & N. Lantern Company, 256 Broadway, New York. In addition to this feature, demonstrations have shown the lantern to be practically gale proof which makes it desirable as a riding light, a deck lantern, in fact, as a general emergency light for all manner of ship service. The wick control mechanism is such that the flame can be readily adjusted in any wind. The red



**The Lantern as Ordinarily Used. Right, The Red Globe in Position**

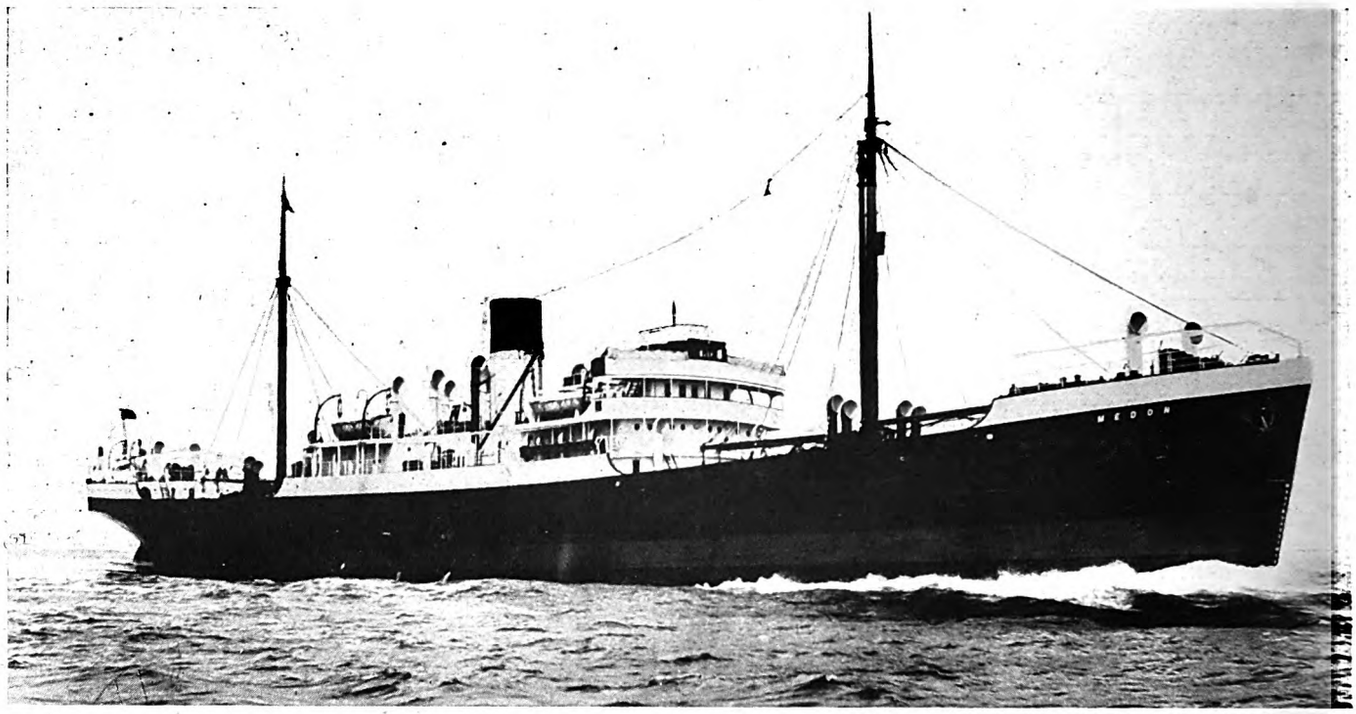
globe is arranged inside the white globe on a threaded metal ring and coiled spring which works inside the shell of the lantern. This ring is controlled by a clip by means of which the red globe may be raised into position when required, or lowered out of sight in the shell.

The lantern is made from cold rolled steel or brass in various finishes—nickel, gun metal, galvanized, etc. The lantern top and lower shell are drawn from a single piece of metal, thus eliminating seams. The guard rings and frames are of heavy construction, spot welded or brazed depending on the material used. The oil font in all cases is drawn from a single piece of brass. It is designed to slip easily into the base of the lantern in any position where, when it is in place, the wick control engages with the top of the well so that when the font is rotated from the bottom, the wick is adjusted up and down. This feature makes it possible to adjust the flame without exposing it to the action of the wind. The top is equipped with a large hinge having a removable cotter pin and locks in place with a heavy spring. The handle fastens directly to the guard frame and is designed to remain in an upright position, or as desired. Either signal oil or kerosene burners are used.

---

All amendments to the rules and regulations of the Steamboat Inspection Service restricting the age of applicants for license to 21 years have been rescinded.

Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



The 8,000-Ton Medon Built for the Holt Blue Funnel Line

# Royal Mail Orders Two 20,000-Ton Motor Liners

## To Be Propelled by Burmeister and Wain, Twin-Screw, Double-Acting, Four-Cycle Engines—New Single Screw Motorships

**By Our Special London Correspondent**

UNTIL about six months ago, it was not generally anticipated in British shipping circles that the oil engine would make much progress in its application to the propulsion of large passenger liners. It was thought that its field would, for some time to come, be limited to cargo ships. A change of attitude has apparently occurred, with the result that owners are not merely considering the possibilities of motor passenger liners, but are actually inclined to favor this type, in preference to the geared turbine ship.

It was therefore not entirely a matter of surprise to those who knew something of these developments to learn that the Royal Mail Steam Packet Company had ordered two 20,000-ton motor liners, which it is believed, will eclipse in luxury any they now possess. No official details have yet been published regarding the dimensions and machinery of these interesting vessels, but the writer believes the following particulars may be taken as correct.

### Propelling Machinery

The length will be about 630 feet, so that these two ships will be considerably larger than the motor liner now being built on the Clyde for the Union Steamship Company, of New Zealand, and which is 600 feet in length. Twin-screw machinery will be installed, and the total power developed will be in the neighborhood of 14,500 shaft horsepower. The vessels will be built by Harland and Wolff at Belfast and the engines will be of the new double-acting, four-cycle type developed by Burmeister and Wain, for which firm Harland and Wolff are the British licensees.

These motors will have the same cylinder dimensions as the two engines to be installed in a 17,000-ton motor liner for the Swedish Amerika Line, but instead of having six cylinders, there will be eight. Therefore, if the Harland and Wolff engines ran at the same speed as those built by Burmeister and Wain, they would normally have an output of 9,000 brake horsepower. It may be remembered, however, that in the motors now under construction for the Swedish Amerika Line's passenger boats, the air compressors are not driven directly off the engines, but that three separate compressors are to be installed in the engine room driven by a 600 horsepower Diesel engine.

In the new Royal Mail liners, a more normal system will be employed, and the air compressors—two in number—will be driven off each engine. As a result of this, combined with lower engine speed than that adopted by the Danish builders, the output of each engine will be only about 7,250 brake horsepower. The diameter will be 840 millimeters, the stroke 1,500 millimeters and the piston speed will be kept down to about 1,100 feet per minute.

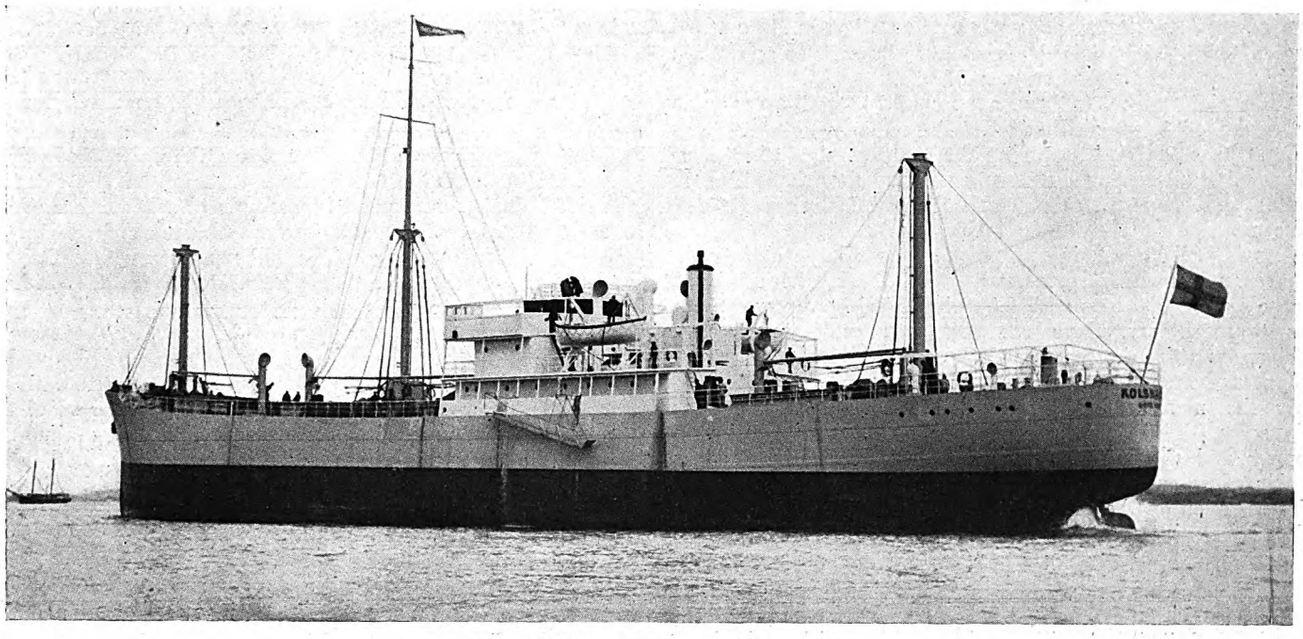
### Pistons to be Oil Cooled

There will be a very large electrical installation as all auxiliaries are to be electrically operated. It is understood that one of the most interesting features in the design of the engines, apart from the adoption of the double acting principle, is that oil cooling will be utilized for the pistons. To the engineer who has followed Diesel engine development during the past ten years, this seems somewhat like a retrograde movement, since oil cooling was adopted many years ago and afterwards abandoned in favor of fresh water cooling in some cases, and salt water in others.

The use of lubricating oil in these large engines is the re-



Generated on 2024-09-12 16:22 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



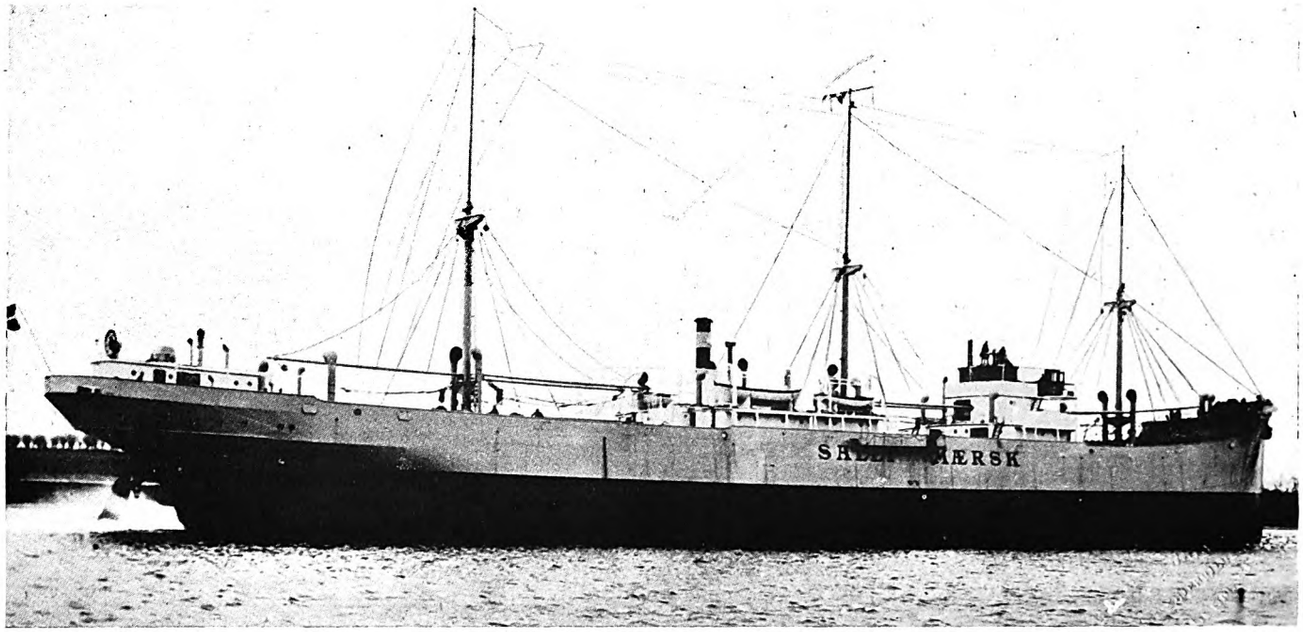
The 4,400-Ton Motorship Kolsnaren

sult of some very successful trials that have been carried out on the single cylinder 1,000 horsepower unit which Burmeister and Wain built for experimental purposes. It should be remarked, however, that the oil which circulates around the piston is not actually used for lubricating. A closed circuit is maintained and the oil is utilized for no other purpose than for reducing the temperature of the piston head. It is claimed that with this arrangement the temperature can be kept down to a normal figure so as to prevent carbonization, which was one of the original troubles, and, moreover, with an entirely closed circuit the loss will be extremely small.

### MANY SINGLE SCREW MOTORSHIPS

The increasing confidence which is now felt in the oil engined vessel among all classes of shipowners is reflected in the growing number of single screw vessels of this type which are now being commissioned. There is no doubt that hitherto the employment of twin screws has been almost wholly due to the fear of unreliability, since nine shipowners out of ten, or perhaps even a larger proportion, are greatly in favor of the installation of one engine.

A somewhat unusual single screw ship has just been completed for Alfred Holt and Company, one of the largest shipowning concerns in Great Britain. This vessel, the *Medon,* built on the Tyne, has a deadweight capacity of 8,000 tons, is 400 feet in length and is a duplicate of several steamers owned by the same firm, so far as power and dimensions are concerned. She is fitted with a 3,000 indicated horsepower Burmeister and Wain engine, this being the biggest motor of the long stroke slow speed type that has yet been constructed, operating on the four-cycle principle. It develops



Single Screw Motorship Sally Mærsk

Generated on 2024-09-12 16:49 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

its power at 85 revolutions per minute whereas the normal speed for 3,000 indicated horsepower, Burmeister and Wain engines is 115 revolutions per minute.

The eight cylinders have a bore of 740 millimeters and a stroke of 1,500 millimeters. Particularly noteworthy is the arrangement for supplying the compressed air for starting and maneuvering purposes, as it is a new system which it is understood will be standardized by Burmeister and Wain.

As is well-known, in most motorships a large electrically driven maneuvering compressor is fitted. In British motor vessels of 14,000 tons with 6,000 indicated horsepower twin-screw machinery, there are two such compressors, each driven by a 180 horsepower electric motor. This is a costly plant and the new method adopted in the *Medon* is to supply the maneuvering air from the engines driving the dynamos. There are three of these sets each of 100 horsepower and the injection air compressor normally fitted is enlarged so as to give a surplus output beyond that needed for injection on the engine itself. This surplus is stored in the air reservoirs, and no auxiliary air compressor is needed. Normally, the generating sets operate in the ordinary manner, and when it is desired to charge a starting bottle, a simple change-over device is operated. This seems to mark a distinct step in the development of auxiliary equipment of motorships.

Another single screw motorship which has just been completed is the 4,400-ton *Kolsnaren* for the Transatlantic Steamship Company of Gothenburg. She is 304 feet long overall, and is propelled by a 1,600 indicated horsepower Burmeister and Wain type engine built by Gotäverken. This also is a long stroke motor which of course was developed specially for single screw propulsion. It is interesting to note that the *Kolsnaren* is a sister ship to the *Hjelmaren* in which a two-cycle Atlas Diesel engine of the same power was fitted. Curiously enough, it is stated that the four-cycle engine occupies less engine room space than the two-cycle type fitted in the *Hjelmaren*.

A third single screw motorship completed a short time ago is the *Sally Maersk*, a 5,200-ton vessel, in which a Burmeister and Wain engine of the same power as that fitted in the *Kolsnaren* is installed. The bore and stroke are 630 and 1,300 millimeters respectively, the normal speed being 90 revolutions per minute. On trials, the *Sally Maersk* which is 331 feet long overall, and has a guaranteed speed of 10 knots, showed a fuel consumption of 4.9 tons daily. The single screw ship seems to give slightly better results than twin-screw craft, the fuel consumption being almost invariably 5 percent lower. It may be added that the *Medon* appears to be an exceptionally economical ship since her consumption works out at under 9 tons daily. This is a very good result for an 8,000-ton vessel with an average speed of approximately 11½ to 12 knots.

The Holt Line has just taken delivery of another motorship, the *Tantalus*. This is a twin-screw craft carrying about 11,000 tons deadweight, and is one of the largest of recently built motorships. Two 3,000 indicated horsepower Burmeister and Wain engines are fitted but these are of the short stroke type running at 115 revolutions per minute. The *Tantalus*, which is 477 feet long, attained a speed of about 14½ knots on trials, and it is anticipated that the fuel consumption will not exceed 20 tons daily.

# Automobile Carrying Fleet Developed on Great Lakes

## Forty-One Steamships in the Trade Carry Over 250,000 Cars Per Season—Total Freight Amounts to $5,000,000

**By Alfred C. Jackson**

A NEW transportation service, with a season's revenue of over $5,000,000, has been developed on the Great Lakes by the automobile industry and with it the city of Detroit is regaining its title as a Great Lakes port which was lost 30 years ago when the Ward Line dwindled and died. This new business is handled by a fleet of 30 freight vessels, aggregating 95,722 gross tons, together with several tramp or "casual" vessels and 11 large passenger steamers. The total premium for the marine insurance placed on the cargoes of automobiles carried in a season is based on a value of $380,000,000.

### Method of Loading

Most of the steamers used for the transportation of automobiles are provided with 'tween decks and with one or two steam winch-driven elevators which lower the cars into the hold. The speed of loading depends upon the speed of the elevator but averages about 30 cars an hour. The rate of unloading is about the same as that of loading. Side ports are generally unsuitable, as to handle all models of closed cars they must be 8 feet high which is a greater height than is permitted by the classification societies on account of the resulting weakness in the vessel's structure. Less time is required to load a cargo of automobiles than is required for many other types of cargo.

Automobiles are shipped from Detroit docks to Cleveland, Buffalo, Ashtabula, Erie, Toledo, Duluth, Milwaukee, Chicago, Ogdensburg, Montreal, etc., and from some of these ports to other Lake ports as well. The manufacturers drive the cars to the steamship docks where they are stored in fireproof warehouses built on the piers. From the warehouses the cars are driven up an inclined runway on to the deck of the vessel whence they are lowered to the 'tween decks or hold by the elevators. When in position, the cars are placed in low speed gear with the emergency brake set and in some cases they are further secured by wheel blocks.

A list of the automobile trade fleet from Detroit, its cargo capacity per trip and the routes is as follows:

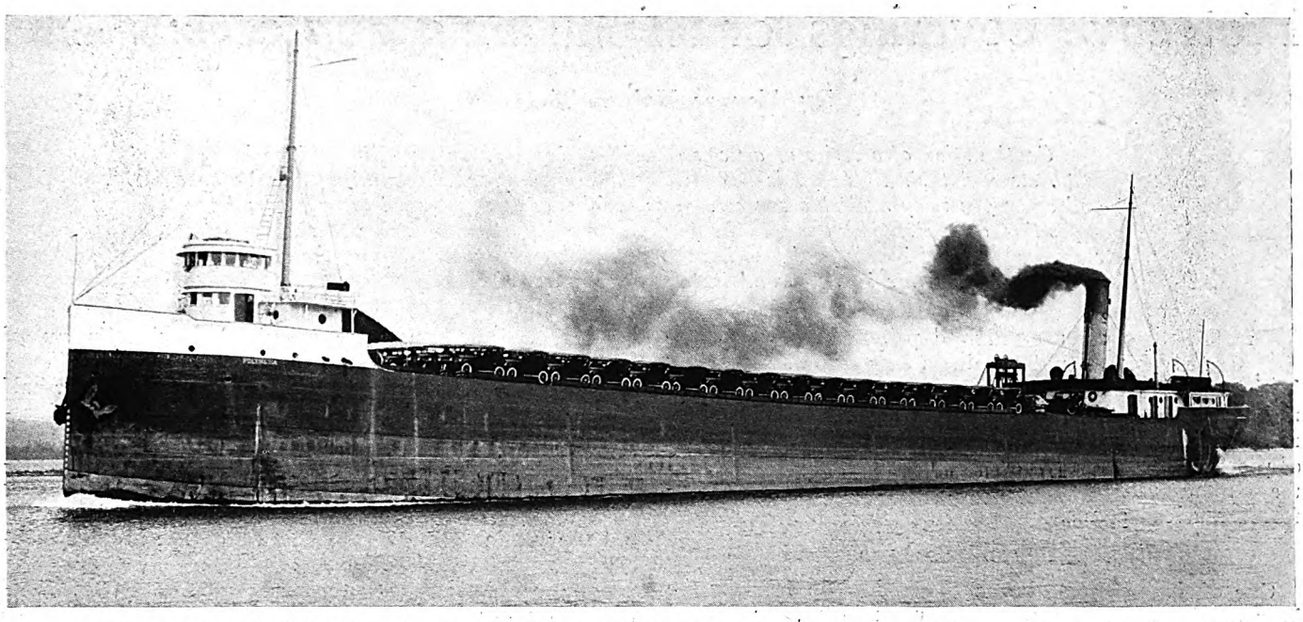
Detroit and Cleveland Navigation Company, Detroit.
Passenger boats, daily to Buffalo, 85 cars a trip.
Passenger boats, daily to Cleveland, 200 cars a trip.

Tri States Steamship Company: Cleveland, Chicago, Detroit, Milwaukee and Buffalo service, four sailings a week.
Freighter *Polynesia*, 350 cars a trip.
Freighter *Lakeland*, 310 cars a trip.
Freighter *Westland*, 240 cars a trip.
Freighter *Clifton*, 200 cars a trip.
Total: eleven hundred cars per trip.

Universal Steamship Company: Chicago-Detroit run, three sailings a week. Package freight carried from both ports as well as automobiles. Chartered steel boats.

Freighter *Spokane*, 240 cars a trip.

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN



**Lake Freighter Polynesia, of 5,700 Tons Deadweight, Carrying Deck Load of Automobiles. This Vessel Is Fitted with 'Tween Deck, and Elevator Can Be Seen Just Forward of After Deck House**

Freighter *P. Foster,* 170 cars a trip.
Freighter *E. Oglebay,* 220 cars a trip.
Total: 630 cars a trip.

Nicholson Transit Company: Detroit, Toledo, Cleveland, Erie, Buffalo, Chicago and Milwaukee.

Steel freighter *Sultana,* 350 cars a trip.
Steel freighter *Sonora,* 350 cars a trip.
Wood freighter *Fellowcraft,* 200 cars a trip.
Wood freighter *Roumania,* 200 cars a trip.
Total: 1,100 cars a trip.

Rutland Lake Michigan Transit Company, Detroit, Ogdensburg, Chicago, Milwaukee service. Owns and will operate four steamers in the automobile and grain and package freight trade as above. Now operates three vessels and has another en route from the seacoast—the *Backbay.*

The S. S. *Burlington, Bennington, Brandon* and *Backbay* have a trip capacity of 150 cars each, or 600 cars per trip—although it is figured that they will carry only 12,000 cars a season as they have large merchandise tonnage to haul.

Great Lakes Transit Corporation: Buffalo, Erie, Cleveland, Detroit, way ports to Duluth, and from Buffalo to Chicago via Detroit, Milwaukee, etc.

Owns and operates twelve steel steamers in the automobile trade. The vessels are package freighters and carry flour on the return trips. The 12 steamers will carry 1,500 cars a trip. This firm operates three steel passenger steamers which run every three days from Detroit and carry 45 machines each trip, making a total of 1,635 cars a trip.

Crosby Line: Detroit to Milwaukee service. This is the last line to enter the automobile carrying business.

Owns the wooden steamer *Tom Davidson,* with a trip capacity of 250 cars.

Other vessels include the *Fleetwood,* the original wooden automobile trader, 165 cars a trip, and the *Bielman,* with 260 cars a trip, also wooden steamer, and the *Tampico,* a steel ship.

The Northern Navigation Company, Detroit to Duluth, and Fort William, Port Arthur.

Three sailings per week of passenger steamers, with 50 cars each, or a total of 150 a trip.

The White Star Line, Detroit to Toledo.

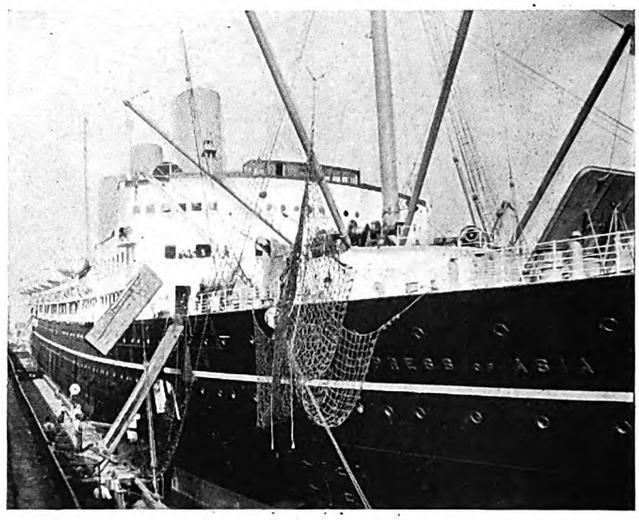
Two passenger boats daily. Total, 20 cars.

Altogether, therefore, there are 41 steamers in the trade, of which only 5 are wooden vessels. Most of the lines own their own steamers and only a few charter vessels.

The trip capacity of the steamers is over 6,385 automobiles per sailing, or for the season, allowing for the carriage of package freight, etc., a total of 250,000 cars.

The revenue runs from $10 to $40 per car—and averages $20 to $25—so that a very conservative total is five million dollars freight for the season.

While the situation has brought relief to the automobile makers, and profits to the vessel owners, it has instilled real happiness in the hearts of veteran vessel men, who for years have watched with regret the stately processions of freighters move past Detroit. The vessels are now stopping at this port in increasing numbers. Detroit is again a port instead of a mail station, and the old tars are digging up their musty oil skins and beginning to stretch their sea legs.



**Empress of Asia Loading Automobiles for Japan**

The picture shows the Canadian Pacific liner *Empress of Asia,* loading several car loads of automobiles which she carried in her hold when she last sailed for Yokohama. Flat cars with five and six automobiles to the load came alongside the great liner. Each case weighed approximately 4,500 pounds.

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Protective Coverings for Shipbuilding Purposes: Paints

By Horace Holden Thayer*

*Continuation of a series of articles containing information regarding shipbuilding materials and their uses that is not readily obtainable from shipbuilding handbooks and other generally available sources. The articles are not intended to be a complete exposition of the subject but will be found to contain items of value to the various classes of workers in this field who have to deal with these materials from the materials point of view. This is the second installment of the article on paints.*

EFFORTS to produce red lead paints the pigment content of which would remain in suspension have mainly been along the lines of the addition of some inert material, such as asbestine (silicate of magnesium), to the red lead rather than attempts to produce a superior article. A number of products resulting from such efforts are on the market and they are frequently called, and may be classified as, reinforced red lead paints.

### Reinforced Red Lead

One of these paints adopted as standard in 1918 by the War Service Committee of the Paint Industry, for general priming work on steel hulls has the following specifications:

Pigment, 65 percent.
Liquid, 36 percent.
The pigment portion shall consist of—
Red lead (not less than).....60 percent
The balance shall be silicious matter, such as aluminum silicate, magnesium silicate, silica, or a mixture thereof.
The red lead used shall contain not less than 85 percent $Pb_3O_4$, the balance to be PbO.
The liquid portion shall consist of—
Pure raw linseed oil (not less than 90 percent), the balance to be combined drier and thinner. The thinner shall be turpentine.
Special requirements: The paint shall weigh not less than 16 pounds per gallon. It is intended to be used for a priming coat on steel and when applied to a smooth iron surface, it shall dry in 12 hours, without running, streaking or sagging.

During 1918 a number of well known paint manufacturers adopted the following formula for the manufacture of this kind of paint:

Pigment, 70 percent.
Liquid, 30 percent.
*Pigment:*
The pigment portion shall consist of not less than 80 percent red lead. The balance shall be silicious matter, such as aluminum silicate, magnesium silicate, silica or such mixtures thereof as will insure the production of a prepared red lead paint which will hold well in suspension. The red lead used shall contain not less than 85 percent $Pb_3O_4$; the balance to be PbO. The red lead is to be finely ground.
Under silicious matter 3½ percent may be sesquioxide of iron.
*Liquid:*
The liquid portion shall consist of not less than 70 percent of pure raw linseed oil.
The balance of the liquid, 30 percent, shall be combined drier and thinner. Thinner will be 11 percent volatile mineral spirits.
*Special Requirements:*
The paint shall weigh approximately 18 pounds per gallon and is intended for general use as priming coats on steel ships and when applied to a smooth iron surface it shall dry in 12 hours under normal conditions without running, streaking or sagging.
The paint must be satisfactory in every respect, including body, freedom from objectionable settling or caking in package. Paint must also have satisfactory working qualities, hiding power, drying, color, gloss and durability.
Percentages are to be by weight unless otherwise specified.
Packages shall bear proper identification as regards certification marks.

These specifications were submitted to the Bureau of Standards who pointed out the fact that the paint contained only 10 pounds of red lead per gallon of paint, or one-half the amount in the United States Shipping Board specifications before mentioned, and stated their opinion that red lead paints are more efficient as protectors for steel in proportion to the red lead present. They also stated that they made up a paint according to the specifications and found it to be very thin. They recommended a change in the specifications for the liquid as follows:

The liquid portion shall consist of not less than 90 percent of pure raw linseed oil.
The balance of the liquid, 10 percent, shall be combined drier and thinner. The thinner may be turpentine, mineral spirits, or a mixture thereof.

A well known proprietary reinforced red lead paint has the following formula:

| | | | |
|---|---|---|---|
| Pigment—57 percent. | Red lead (85 percent $Pb_3O_4$) | .... | 80 percent |
| | Silica and silicates | ..... | 20 percent |
| Vehicle—43 percent. | Linseed oil | ..... | 86 percent |
| | Drier and thinner | ..... | 14 percent |

Weight per gallon—14¾ pounds.

The general manager of a paint manufacturing company which turns out a reinforced red lead paint made up with boiled linseed oil as a vehicle told the writer he recognized it was not the paint for use on shipboard, although he had a record of very good results from the use of this paint as compared with the United States Navy standard red lead paint as an acid resisting paint and for railroad work. He realized that the marine service called for a higher proportion of pigment and a harder paint, notwithstanding their use of boiled oil for the latter purpose.

### Graphite

The use of natural graphite instead of asbestine with red lead produces a paint which if properly made is an improvement over the reinforced red lead paints. We may classify such a paint as a graphite paint although the pigment should be largely red lead. Graphite paint that is not made up with a large percentage of red lead and with linseed oil as the major part of the vehicle has not proved its value as a priming paint, as far as is known to the writer. A tendency with this kind of paint is to have too little pigment as, on account of the strong brown color, a very thin coat will appear to be a good coating. There is also a tendency to have the graphite too coarsely ground. The natural graphite mineral is not pure carbon and the composition of the paint will depend considerably upon the composition of the graphite. The writer believes that the following is, however, a representative analysis:

| | | | |
|---|---|---|---|
| Pigment—53.4 percent | Red lead (89 percent $Pb_3O_4$) | . | 52.01 percent |
| | Carbon | ..... | 19.74 percent |
| | Iron oxide | ..... | 6.55 percent |
| | Zinc oxide | ..... | 2.25 percent |
| | Silica and insoluble | ..... | 19.45 percent |
| Vehicle—46.6 percent | Oil, mainly linseed | ..... | 84 percent |
| | Thinner and drier | ..... | 16 percent |

Weight 13.24 pounds per gallon.

*Member of the firm of Rossell & Thayer, naval architects and marine engineers, Philadelphia, Pa.



Generated on 2024-09-12 16:22 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

This does not appear on the face of it to be an improvement over a reinforced red lead paint, but the graphite is itself a valuable pigment, as the tests referred to later show, and the principal manufacturer in this country of this kind of paint has produced a product which has been used extensively as a priming paint in the marine field with good results. This company uses a good grade of red lead and their own graphite, and the vehicle is mainly linseed oil with a small proportion of China wood oil. They claim that the graphite makes the paint more elastic than a pure red lead paint and that the China wood oil fills up the pores in the linseed oil and makes the paint more waterproof than a paint containing only linseed oil.

In the tests made by the American Society for Testing Materials artificial graphite appeared to be of little or no value as a pigment in paint designed to protect iron or steel from corrosion, and it is not to be expected that a desirable marine priming paint can be produced with all natural graphites. The graphite in the above analysis was mined in Superior, Wis.

### OXIDE OF IRON

There are many paints proposed for use as priming paints which have pigments that are largely iron oxide. In actual service as priming paints they are inferior to red lead paints, and possibly the reason is the difficulty of freeing the iron oxides from soluble or injurious constituents.

Sometimes oxide-of-iron paints are made from by-products of sulphur compounds, and calcium carbonate is added to offset the evil due to the presence of the sulphur. This results in the formation of calcium sulphate, which is soluble, and possibly harmful.

One manufacturer whose paint is used extensively for structural metal work on land has added to the iron oxide chromates of lead and zinc. He states that the latter were found to be particularly valuable in resisting rust stimulation, and this appears to be substantiated by the tests referred to later on in this article.

A proprietary oxide-of-iron paint that has been considerably used as a priming paint in ship construction is said to have the following analysis:

| | | |
|---|---|---|
| Pigment—55 percent | Iron oxide | 70 percent |
| | Silicious earth pigments | 30 percent |
| Vehicle—45 percent | Raw linseed oil | 50 percent |
| | Linseed oil, heat treated | 25 percent |
| | Drier and volatile mineral spirits | 25 percent |

Another proprietary metal protective paint which is used by some shipbuilders and the pigment of which is largely Spanish Red has approximately the following analysis:

| | | |
|---|---|---|
| Pigment—48.0 percent | Iron oxide | 56.0 percent |
| | Zinc oxide | 10.0 percent |
| | Calcium sulphate | 2.0 percent |
| | Lead sulphate | 1.0 percent |
| | Silicates (asbestine) | 24.0 percent |
| | Organic matter, etc. | 7.0 percent |
| Vehicle—52.0 percent | Linseed oil | 64.0 percent |
| | Gums | 8.0 percent |
| | Petroleum oil | 28.0 percent |

Some proprietary oxide of iron paints have red lead as well as zinc oxide and other materials as a part of the pigment. Some lay great stress on a prepared linseed oil vehicle. Others do not use any linseed oil at all. An analysis of one of such paints proposed for marine service as a priming paint on steel is as follows:

| | | |
|---|---|---|
| Pigment—35.6 percent | Iron oxide | 27.8 percent |
| | Red lead | 24.0 percent |
| | Calcium sulphate | 40.6 percent |
| | Silica | 1.0 percent |
| | Organic matter and dye | 6.6 percent |
| Vehicle—64.4 percent | A tung oil | resin varnish |

Although the red lead in this paint by weight is almost as large a portion of the pigment as the iron oxide, it is much less so by volume, and the calcium sulphate, as previously stated, is soluble in water. The formula as a whole looks unattractive.

About 1918 the Mare Island Navy Yard conducted experiments on paints to be used as a substitute for red lead priming paint on account of the poisonous nature of the red lead powder and the high cost of red lead and linseed oil, and met with considerable success with the following formula:

| | |
|---|---|
| Venetian red in oil | 2½ pounds |
| Metallic brown in oil | 2½ pounds |
| White zinc oxide in oil | 1 pound |
| Drier | ½ gallon |
| Mixing oil (China wood) | ⅝ gallon |

The writer has not heard of any recent developments along this line.

### ELATERITE

A paint made from Elaterite which has been referred to under the preceding article on "Bituminous Compositions," is proposed by its makers as a priming paint. There is no question of the value of this paint as a priming paint on inside work, where subsequent coats can be of the same material, but the writer has had no experience with it as a priming paint under other paints, and it is questionable if other paints will adhere well to it and will not be softened or discolored by it.

### WHITE ZINC

This is a good pigment theoretically but it scales off of steel work.

### TESTS

In 1908 the American Society for Testing Materials set up steel panels at Atlantic City which were coated with about fifty different kinds of paint. The plates had previously been cleaned by pickling. The pigments were purchased in the open market, and mixed into a vehicle consisting of ⅔ gallon of raw linseed oil and ⅓ gallon of boiled linseed oil. They were made up in consistencies that would allow of a uniform application at the rate of 900 square feet to the gallon, per coat. Three coats were applied. They were inspected annually in 1910 to 1914 inclusive by five inspectors, including Dr. P. H. Walker and Dr. H. A. Gardner, and graded from zero to 10 by each one, for the condition of the plate as regards corrosion and for the condition of the coating. The following table shows the average of the individual gradings at the 1914 inspection for the ten best paints as regards protection of the steel from corrosion, and for several others which are of particular interest in a consideration of priming paints on ship steel:

| | Pounds Pigment Per Gallon Oil | Weight of Paint Per Gallon | Average Rating |
|---|---|---|---|
| 1. Basic lead chromate | 20.49 | .... | 7.5 |
| 2. Sublimed blue lead | 19.17 | 20.17 | 6.0 |
| 3. Carbon black (99 percent carbon) and nat. barytes | 1.39 / 10.03 | 13.92 | 5.0 |
| 4. Chrome green, blue shade | 13.32 | 16.17 | 5.0 |
| 5. Willow charcoal | 4.47 | 9.00 | 4.5 |
| 6. Red lead | 26.10 | 24.42 | 4.0 |
| 7. Natural graphite | 7.80 | 11.42 | 4.0 |
| 8. Zinc chromate | 10.71 | 13.08 | 4.0 |
| 9. Zinc and lead chromate | 14.28 | 16.0 | 4.0 |
| 10. Black iron oxide | 15.00 | 16.0 | 4.0 |
| 11. Orange mineral | 26.91 | 24.75 | 3.0 |
| 12. Metallic brown | 9.51 | 12.5 | 3.0 |
| 13. Bright red iron oxide | 15.78 | 17.08 | 2.5 |
| 14. Venetian red | 9.30 | 12.67 | 1.5 |
| 15. Zinc oxide | 16.68 | 17.67 | 0 (arbitrary) |
| 16. Asbestine | 8.25 | 11.5 | 0 (arbitrary) |
| 17. Artificial graphite (90 percent carbon) | 6.63 | 10.5 | 0 (actual) |

Barytes is barium sulphate and was added to give sufficient

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

body to the paint. The chrome green is lead chromate, lead sulphate, white lead and Chinese blue. The metallic brown is made by roasting iron ore. The bright red iron oxide is 98 percent oxide of iron (copperas red). Venetian red is made by calcining a mixture of copperas and terra alba. The other pigments have been explained or require no explanation.

Paints 3, 13 and 15 were very heavy and required to be reduced by the addition of turpentine.

Although red lead and orange mineral are pretty well down on the list it will be noted that the weight of pigment per gallon of oil is not what it should be for best results, and the amount of true red lead, $Pb_3O_4$, is not stated. This test does not take into consideration the fitness of the paint as a base for other paints, the abrasive wear resisting properties of the paint, and other factors entering into the selection of a priming paint. The results are, however, of considerable interest.

The American Society for Testing Materials has also conducted tests on 19 paints on a railroad bridge at Havre de Grace, Md. The steel was coated with three coats which differed somewhat from each other along the lines of the actual use of the different kinds of paint. They were rated according to class, there being a number of classes. The only paint to retain the first class for the entire period of seven and one-half years was a pure red lead and linseed oil paint in which the red lead was 95.9 percent $Pb_3O_4$. The second best paint was also a red lead and linseed oil paint, but in this case the red lead was 88.5 percent $Pb_3O_4$. It remained in the first class for five years and was in the second class for the remaining two and one-half years.

### General

A number of the foregoing paints are proposed as priming paints not because they are equal to the standard red lead and oil but because they can be sold at a lower price and are attractive on that account. The priming coat of paint on steel is, however, one of the worst items on which to try to save money, and the reader will probably realize this from what has been written. Where circumstances appear to merit a departure from the old stand-by, red lead, and a trial of some other make of paint, the analysis and other information here given may prove to be a guide to the probable value of the proposed paint and the result to be expected from it. It must be remembered, however, that some proprietary paints of about the same analysis may differ widely in value.

### Protection of Wood

The priming paint for the protection of wood and similar absorbent and non-corrosive materials is not so important a part of the protective coating as priming paint on steel and iron and its functions are not so varied. Its principal requirement is that it shall form a good backing and binder for the second or heavy coat of paint.

Wood absorbs the vehicle and therefore the priming paint has to be relatively thin or the oil will all go into it and leave the pigment as a dry non-adhesive coating, not suitable as a binder for the next coat. Pitchy spots do not so readily absorb the oil and for this reason as well as to reduce costs a considerable amount of turpentine is generally used, which has a solvent action on the pitch and makes the absorption more uniform. The pigment part of the priming paint is generally the same as that of the subsequent coats, except for the addition of color to the latter in some cases.

The wood should be thoroughly dry before applying the paint.

### White Lead and Zinc Oxide

White lead either as basic sulphate or basic carbonate together with zinc oxide has been found to be the best all around pigment combination for priming coats on wood. The oil should be pure linseed oil and the entire vehicle is the vehicle of succeeding coats, except that it is thinned with turpentine to the amount necessary to get good penetration. About 40 percent of oil and 60 percent of turpentine is a standard proportion. The turpentine, being volatile, soon evaporates. For the highest grade of interior work the surfaces are first shellacked and then painted with priming paint, well brushed into the wood, after which they are sandpapered. The further treatment will be dealt with in another article.

The old fashioned practice was to use all linseed oil and less pigment and that is probably well worth the extra cost on outside work. One old formula of this nature is as follows, the oil being boiled for outside work and raw for inside work:

| | |
|---|---|
| White lead | 7 pounds |
| Red lead | ¼ pound |
| Linseed oil | 3 pints |
| Drier | 2 ounces |

The white paint adopted as standard by the United States Shipping Board Emergency Fleet Corporation has the following specifications, resulting from the work of Dr. P. H. Walker and Dr. H. A. Gardner:

### White Paint

(a) The paint desired shall have a clear white color. The pigment shall have the following compositions:

Zinc oxide—not less than 25 percent nor more than 50 percent.

The remainder may be either basic sulphate—white lead or basic carbonate—white lead, or a combination of the two.

(b) If desired, there may be substituted for a part of the lead pigments either magnesium silicate, silica, barium sulphate, or calcium carbonate, or mixtures of these pigments, in amounts not aggregating more than 15 percent of the total pigment. In any event the pigment portion of the paint shall contain not less than 85 percent of total lead and zinc pigment.

(c) A trace of blue (ultramarine) may be added to make a clear white color.

(d) The vehicle shall consist of pure linseed oil, liquid drier and volatile thinner, which may be either turpentine or mineral spirits, or a mixture of these. No resin shall be present. The total volatile thinner, including that contained in the liquid drier, shall not xceed 10 percent of the total vehicle.

(e) The paint shall contain not less than 64 percent by weight of pigment and weigh not less than 15¼ pounds per gallon. The paint must be satisfactory in every respect, including body, freedom from objectionable settling or caking in can. The paint must have satisfactory working qualities, hiding power, fineness, drying, color, gloss and durability.

(f) Bidders must submit exact composition of paint they purpose to furnish. Such formulas must fall within the limits prescribed above.

The inside white of the United States Navy Department, which is used for priming coats when the finish is white, often without thinning, has the same ingredients, but the white lead and zinc oxide are each 50 percent of the pigment, the pigment weight is a greater percent of the total and a gallon of the paint weighs 18 pounds. The proportions per gallon are as follows:

| | |
|---|---|
| White lead in oil | 7 pounds |
| Zinc oxide in oil (American) | 7 pounds |
| Raw linseed oil | 7 2/3 gills |
| Mineral spirits | 8 1/6 gills |
| Drier | 1½ gills |
| Ultramarine blue, in oil | 1½ ounces |

Where the finish is gray the Navy Department uses the same paint for priming coats as finishing coats also. It has the following formula, for one gallon:

| | |
|---|---|
| Barium sulphate, in oil | 3 pounds 11½ ounces |
| Zinc oxide, in oil | 4 pounds, 7½ ounces |
| Lampblack, in oil | 1.4 ounces, about |
| Linseed oil, raw | 3.8 pints |
| Mineral spirits | ½ gill |
| Drier | 5 gills |
| Weight per gallon | 15 pounds, 8 ounces |

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

A number of the shipyards and other marine users of priming paints mix them up themselves in order to be sure of results. One shipyard uses pure white lead only as the pigment, and a vehicle that is half linseed oil and half turpentine, with a small quantity of Japan drier.

There are a number of proprietary priming paints on the market and one well known one has the following analysis:

| | | |
|---|---|---|
| Pigment—65.7 percent... | Lithopone | 93.0 percent |
| | Lead sulphate | 6.2 percent |
| | Silicon dioxide | .8 percent |
| Vehicle—34.3 percent.... | Linseed oil | 35.3 percent |
| | Mineral spirits | 64.7 percent |

Lithopone is a somewhat variable mixture of zinc sulphide, barium sulphate, zinc oxide and zinc carbonate. It should contain not less than 26 percent of zinc sulphide.

### RED LEAD

Red lead is considerably used as a priming paint for wood in some localities and appears to be particularly valuable where the wood is full of pitch and will not take paint well, as it is less likely to soften and blister over pitchy spots. Its color is against it if the finish is to be white, but it is not likely to affect grays or other tints. A mixture of half red lead and half white lead may be used even if the finish is white.

Dr. A. H. Sabin recommends the following formula which makes 6 gallons of paint, as priming paint for cypress, yellow pine and similar woods:

100 pounds paste red lead
1¾ gallons raw linseed oil
1¾ gallons turpentine
¼ gallon drier.

He also recommends the following which makes 7½ gallons of paint, for white pine, poplar and similar woods:

100 pounds paste red lead
4½ gallons raw linseed oil
½ gallon turpentine
¼ gallon drier

# Marine Underwriting Conditions Unsatisfactory

## Annual Report of United States Salvage Association Discloses Difficulties—Syndicates "B" and "C" Make Gratifying Returns

**By "Bordereaux"**

DISTRIBUTION is now being made of the report of the annual meeting of the United States Salvage Association for the year 1922, just from the press. It is irrefutable evidence of the success of this great undertaking and stamps it as a factor of prime importance in the shipping life of the country. Manager Lawrence J. Brengle, of the association, reviewed the work of last year in considerable detail. He pointed out that at present underwriting conditions are far from satisfactory, due to the low value of tonnage and the complete demoralization of the foreign insurance market, "which has been willing to accept risks at rates which leave no possible chance for profit owing to the fact that the cost of repairs is still at a high level, being estimated at least 50 percent in excess of pre-war prices."

The underwriting exhibits incorporated in the report give gratifying evidence of Syndicate "B" having shown a profit for 1920 and 1921 of $484,843.96, or 71.57 percent, after taking into consideration all expenses, including paid and estimated losses, as well as expenses of operation, which latter amount to but 3.67 percent.

The real activity of the Syndicates is shown by the business done in Syndicate "C," which has endeavored to retain at fair rates an interest in those fleets in which it was felt a reasonable profit could be made, and decline fleets on which the foreign market quoted rates which would apparently exclude any hope of profit. The profits on the 1920-1921 business may now be considered as earned, the account showing a credit balance of $1,853,810.25, equal to 34.27 percent, after deducting all expenses including paid and estimated losses, as well as expenses of operation, which latter amount to but 1.68 percent. While the 1922 account does not at present show a profit it must be borne in mind that that year has not yet run off and that another year at least must go by before any definite figure can be known.

Salvage work of considerable extent and universal success was carried on by the Salvage Association during the past year. Important connections have been made all over the world, and facilities for useful service have been steadily increased.

Hendon Chubb, chairman of the underwriting committee of the American Marine Insurance Syndicates, in a verbal report at the meeting, expressed his views on the present status of hull underwriting in the following terms:

"The present situation in hull underwriting is indeed a very difficult one. It has been brought about by two factors: The owner has been compelled, on account of shipping conditions in general, to reduce his overhead to an absolute minimum, while, due to the increase in underwriting facilities, there has been a disposition on the part of some underwriters to grant reductions in rates and values in order to maintain or increase their premium income account.

"The general trend of the market can be appreciated by recalling the present terms on tank steamers. A well known fleet was originally placed at a 5 percent rate; the next year it was renewed at the same rate, to return 1 percent, if confined to Eastport, Demerara, and, as the vessels always traded within these limits, this was in reality a reduction in rate. The fleet is now done at 3½ percent and the values under which the individual vessels are insured have been reduced proportionately. Its record, as far as we have been able to ascertain, does not warrant this rating."

## Africa Rejects Certificates

IN order to make a marine insurance certificate acceptable in South Africa it is well to have the contract contain the words, "documents to be accompanied by an insurance policy or certificate of insurance." In a recent suit at Cape Town, at which Justice Benjamin presided, the law of the Union of South Africa was declared to be the one under which the merits of the case should be construed, and not the law of the United States despite the fact that the bills of exchange had been drawn by a firm of the latter country. The drafts were each accompanied by what was known as a "through bill of lading" and a certificate of insurance. The "through bill of lading" purported to be a receipt at Leavenworth, Kansas, for carriage to Cape Town by way of certain American lines of railway to New York, and thence by the American-African Line to the port of destination, Cape Town. In his Lordship's opinion such a document could not be regarded as a bill of lading under the law of the Cape Town Province. It had been decided in England

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

that a bill of lading, from the earliest times, was a document which acknowledged shipment aboard a particular ship.

As regards the certificates, his Lordship observed that "they were merely certificates and not policies." These certificates, he said, had been held in England not to be policies of insurance, and as justifying the repudiation of the contract in which they had been tendered by the seller. "Both were recognized in the Union by custom. But the evidence on this point was not sufficient to prove 'custom,' which, as had been laid down by the Appellate Division, must be reasonable, immemorial and certain."

## Hull Underwriters Complain

INJUSTICE is charged by certain English hull underwriters in that, despite their being charged half additional premiums on total loss reinsurances when vessels have broken trading warranties, they are nevertheless refused any return on the total loss reinsurance when the original "all risks" policy has paid one for special trading. Discussing this point an authoritative critic observes: "Had the insurance been based on the assumption that the special trade would be the one the vessel was employed in, the original rate would have been reduced by the amount of the return, and the warranties would have limited the vessel to the specific trade. Had she gone outside that trade, an additional premium would have been paid, in which the reinsuring underwriters would have participated. This would have achieved the same result as the giving of wider warranties and leaving it open to the owner to collect a return for special trade, except that the reinsuring underwriter gets an additional premium in the former case, but makes no return in the latter."

## Intercoastal Coverage

THERE has been a considerable profit to underwriters in the large water-movement of freight to the East and West coasts of this country; and there have been comparatively few disasters. Much of this intercoastal trade is insured by the shippers with the carriers under the bill of lading, the carriers, in turn, declaring such insurance to their open cargo underwriters. On account of the unusual freedom from losses there has been a softening tendency in the rates for this class of business for some time past, and shippers have had no difficulty in obtaining quotations much lower than the bill of lading. Besides that, the shipper with an open policy secures a broader cover than that granted under a bill of lading, as the open policy will unquestionably cover from warehouse to warehouse, whereas the bill of lading insurance attaches and ceases at the port. It is rumored that discounts are being granted under the bill of lading insurance, and it is possible that some such method is being used by the bill of lading underwriters to meet the market tendency toward lower rates. There have been several losses of late, and should their number increase they may exert an upward tendency on the rate.

## Select Dependable Carriers

TOO much importance can not be placed upon the necessity for shippers to make choice of carriers that are financially sound before entrusting business to them. There are so many dependable lines in the market that merchants have only themselves to blame if they become involved in expense and embarrassment through having been attracted to unreliable carriers by the lure of a cheapened rate. Illustrations of this necessity have of late been frequent. Recently the *Capitaine Faure,* of the Fulton Steamship Company, served to point the moral. This vessel lay at New York loaded for the Far East, but her owners found themselves without sufficient money to forward her. The consequence was that her cargo had to be discharged, and the shippers concerned were obliged to form a committee to make arrangements for forwarding their merchandise by some other steamer. At that point in the proceedings, the case stood as an abandoned voyage, due to financial causes. There was, consequently, no liability on the part of the underwriters; but there would have been had the vessel gotten under way.

## Near East Insurance

THE settlement of the Greco-Turk dispute had an important bearing on commercial routes in the Near East. The British are discussing the completion of their proposed rail line from Aleppo to Bagdad, and it is probable that Russia will proceed with the construction of the railroad through Persia to Baluchistan. Before the war, a large part of goods coming out of Northern Persia were shipped by rail to Tiflis, and thence via the Black Sea to Constantinople for transshipment to the United States. Since the war began, these shipments had to be made by way of Bagdad and Basra. As but few ocean steamers load at Basra, a transshipment is frequently made at Karachi or Bombay, thus entailing extra handling and the usual delays and hazards consequent upon transshipment. The principal shipments from Northern Persia consist of rugs, and the long caravan trip, with the possibility of fresh water damage on the voyage down the Tigris, are responsible for much more damage than in all likelihood would occur on the shorter route via Tiflis or Trebizond.

## American Laws and British Cover

THE United States Circuit Court of Appeals has rendered a decision to the effect that insurance policies issued by British companies on American ships operated in or near American waters are subject to the laws of this country and not to those of England. The case was on appeal by the Marine Insurance Company, the Century, and the Employers' Liability, all of England, from the decision of the district court at Baltimore, Md. It was decided by the lower court that these companies were liable in American dollars, not in English pounds, to J. Craig McLanahan, anciliary receiver of the West India Sugar Corporation and the Equitable Trust Company, for the amount of the policies on the barge *Detroit* which was lost in a collision in the Mississippi river on August 27, 1919. At the time of the issuance of the policies a pound sterling was worth $4.77 in American money, but when the collision occurred the rate of exchange had fallen to $3.37. The insurance companies sought to pay the claim at the lower rate, although it was stated in the policies that a pound would be accepted at the exchange rate of $4.75. In his opinion Judge McClintic held that the court was bound by the decision of the English Court of Appeals and the House of Lords in an identical case.

## Bad Stowage Voids Policy

IMPROPER stowage of cargo constitutes negligent navigation and creates an unnecessary increase of the risk, both at common law and under a fair reading of the terms of the policy; and no recovery can be had in consequence. Such was the recent finding of the New York Court of Appeals, in affirming the judgment of the Appellate Division, Third Department, in the case of William N. Cary and Edward L. Gailor v. the Home Insurance Company, 235 N. Y., 296; 139 N. E., 274. In the course of the Court's sum-up citation was made of the case of Leitch v. Atlantic Mutual Insurance Company, wherein it was held that "one

Generated on 2024-09-12 16:46 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

of the conditions implied by law in case of an insurance upon cargo is that it shall be stowed in a safe and proper manner, and in the usual and customary place for the carriage of goods of the description insured, and any breach of this warranty by which the risk is varied and the perils insured against increased vitiates the policy." It was also held that it is the duty of the insured to keep the vessel seaworthy during the risk, if practicable so to do. As regards seaworthiness the Court observed that "a ship is seaworthy when reasonably fit in all respects to encounter the ordinary perils of the sea incident to the adventure insured."

## Repairing One of the Largest Steel Castings in Existence

ONE of the largest Thermit welds which the Metal and Thermit Corporation has ever been called upon to supervise was recently completed on a rudder post casting for the U. S. S. *Saratoga*. This vessel was formerly under construction as a battle cruiser, but under the terms of the disarmament conference was ordered by the Government to be completed as an aeroplane carrier. The casting itself weighed 56 tons and the width of the casting at the fracture was 13 feet 6 inches. The crack extended through this entire part in an irregular line; its length, therefore, was considerably greater than the dimensions given above. The thickness of the section where the fracture occurred averaged about 3 inches, except where it passed through several reinforcing ribs about 15 inches high and through projections of about 26 inches at the top and bottom.

On the recommendation of the Penn Seaboard Steel Corporation, the Government decided to authorize a Thermit

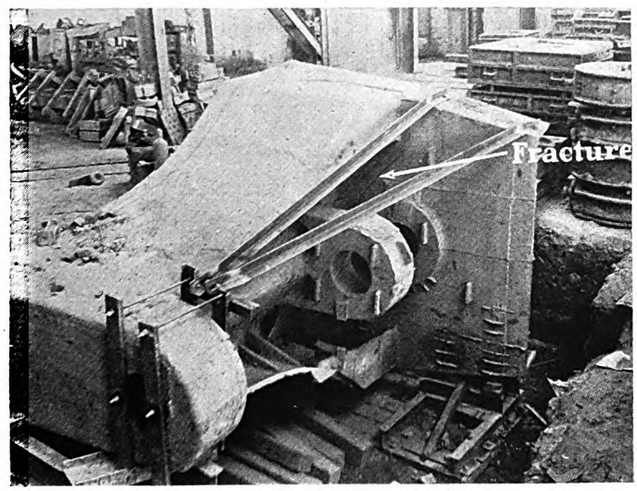



**Fig. 1.—Rudder Post Laid on Its Side on Foundations in Deep Pit Preparatory to Welding**

weld rather than incur the expense of making a new casting which would require about 2 months to complete and would cost in the neighborhood of $20,000. The welding, therefore, was undertaken at the shops of the Penn Seaboard Steel Corporation at Chester, Pa.

In making preparations for welding, the rudder post casting was laid on its side in a deep pit, so as to obtain proper clearance from the overhead crane, also in order to secure greater accessibility to the upper parts during welding. In this position the break extended in a vertical plane, thus allowing the liquid steel to be poured from one crucible and permitting this steel to be gated into the mold at several points so as to secure a uniform flow of superheated Thermit steel by all parts of the fracture.

To support the casting during the welding operation a substantial foundation was built underneath it. Under the large end, a bed plate 12 feet long by 6 feet wide was laid on 12 inch by 12 inch timbers. Two layers of 12 inch I-beams were placed on the bed plate and on these I-beams, 4 inch diameter bosses on stools in turn were placed directly supporting the casting. A small bed plate 12 feet by 3 feet was placed under the small end with five layers of I-beams above the bed plate supporting this end.

The fractured end was braced vertically by means of two angles bolted to channels clamped to the lower gudgeon as shown in Fig. 1.

The gap cut out at the fracture averaged about ¾ inch wide. A total of 80 pounds of wax was used for the pattern.

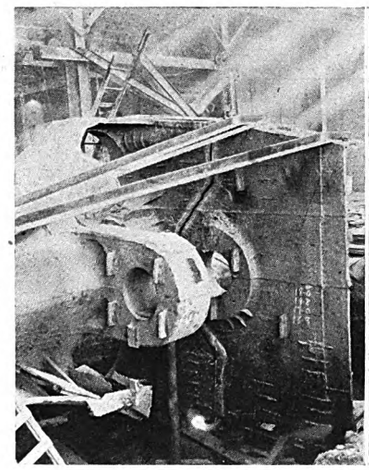


**Fig. 2.—Gap Cut Out at Fracture Fig. 3.—Completed Weld**

The width of the collar averaged about 4½ inches. The wax pattern took two men twelve hours to apply.

The exceptional length of the fracture necessitated the construction of a mold box approximately 16 feet 6 inches high by 4 feet wide by 4 feet 9 inches deep. One hundred pounds of molding material were needed to fill up the mold box. Three days were required to construct the mold box and three more days to ram it.

Preheating was accomplished with seven preheating tanks including five single burner and two double burner tanks. One hundred and seventy-five gallons of kerosene were consumed in the preheating, which was started at 4 A. M. on one day and finished at 6 P. M. the same day, making an elapsed time of 14 hours.

One thousand eight hundred pounds of Thermit in one extra large crucible were used for the reaction. The weld was allowed two days to cool off gradually. Fig. 3 shows the weld with all excess metal removed.

The total length of time consumed in the welding was 15 days, extending from the time when the casting was placed in position ready for cutting out the fracture until after the mold was stripped. This period included two week-ends when no work was done on Sundays and Saturday afternoons. The repair was made by two helpers of the Metal and Thermit Corporation assisted by two helpers from the steel plant, also a man for handling the acetylene torch for cutting out the fracture and cutting the mold box sheets.

THE ATLANTIC COAST SHIPBUILDERS' ASSOCIATION has removed its offices from 1701 to 1600 Walnut Street, Philadelphia, Pa.

DOUGLAS FIR IN BRITISH WARSHIPS.—In one of the two large battleships now building for the British Navy, Douglas fir has replaced teak, according to advices received by the Department of Commerce.

Generated on 2024-09-12 16:59 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# New Shipping Board Wage Scale

AFTER several conferences between the representatives of the United States Shipping Board and representatives of the associations and unions of licensed deck officers, marine engineers and cooks and stewards with reference to wages and conditions on Shipping Board vessels, and after thorough investigation by the board the increases in ship wages as set forth below became effective on July 1.

In considering the matter due weight had to be given to the cost of living, the supply and demand of American labor and the maintaining of such wages and working conditions as would make for stabilization, efficiency and economy. The working out of these things in conference is in line with the established policy of the board of collective bargaining and the recognition of legitimate organizations concerned with ship personnel.

A healthy morale and satisfied and efficient crews to man and care for the ships is necessary. The co-operation and best efforts of marine labor is looked for in helping to establish permanently an American merchant marine on the seas.

DECK OFFICERS

Old Scale

| Class of Vessel | A | B | C | D | E |
|---|---|---|---|---|---|
| Master | $315 | $285 | $270 | $265 | $250 |
| 1st Mate | 175 | 170 | 165 | 160 | 155 |
| 2nd Mate | 155 | 150 | 145 | 140 | 135 |
| 3rd Mate | 135 | 130 | 130 | 125 | 120 |
| 4th Mate | 120 | 115 | | | |

New Scale

| | | | | | |
|---|---|---|---|---|---|
| Master | $335 | $305 | $290 | $285 | $270 |
| 1st Mate | 195 | 190 | 185 | 180 | 175 |
| 2nd Mate | 175 | 170 | 165 | 160 | 155 |
| 3rd Mate | 155 | 150 | 150 | 145 | 140 |
| 4th Mate | 140 | 135 | | | |

ENGINEER OFFICERS

Old Scale

| Class of Vessel | A | B | C | D | E |
|---|---|---|---|---|---|
| Chief Engineer | $280 | $250 | $240 | $230 | $220 |
| 1st Assistant | 175 | 170 | 165 | 160 | 155 |
| 2nd Assistant | 155 | 150 | 145 | 140 | 135 |
| 3rd Assistant | 135 | 130 | 130 | 125 | 120 |
| 4th Assistant | 120 | 115 | | | |
| Junior Engineer | 100 | | | | |

New Scale

| | | | | | |
|---|---|---|---|---|---|
| Chief Engineer | $300 | $270 | $260 | $250 | $240 |
| 1st Assistant | 195 | 190 | 185 | 180 | 175 |
| 2nd Assistant | 175 | 170 | 165 | 160 | 155 |
| 3rd Assistant | 155 | 150 | 150 | 145 | 140 |
| 4th Assistant | 140 | 135 | | | |
| Junior Engineer | 120 | | | | |

STEWARDS' DEPARTMENT

Old Scale

| | Freight Vessels | |
|---|---|---|
| | Foreign Trade | Coastwise |
| Chief Steward | $105 | $95 |
| Steward and Cook | 105 | 95 |
| Chief Cook | 90 | 80 |
| 2nd Cook and Baker | 70 | 65 |
| 2nd Cook | 65 | 60 |
| Butcher | 70 | 65 |
| Messman | 45 | 45 |
| Utilityman | 45 | 45 |
| Deck Messboy | 35 | 35 |
| Engine Messboy | 35 | 35 |
| Stewards' Messboy | 35 | 35 |

New Scale (Effective July 1, 1923)

| | | |
|---|---|---|
| Chief Steward | $120 | $110 |
| Steward and Cook | 120 | 110 |
| Chief Cook | 100 | 90 |
| 2nd Cook and Baker | 80 | 75 |
| 2nd Cook | 75 | 70 |
| Butcher | 80 | 75 |
| Messman | 52 | 52 |
| Utilityman | 52 | 52 |
| Deck Messboy | 42 | 42 |
| Engine Messboy | 42 | 42 |
| Stewards' Messboy | 42 | 42 |

RADIO OPERATORS

Old Scale

| | A | | B | | C | |
|---|---|---|---|---|---|---|
| | License | Wage | License | Wage | License | Wage |
| Chief Operator | 1st | $105 | 2nd | $90 | 2nd | $90 |
| 1st Assistant | 2nd | 95 | 3rd | 70 | None | |
| 2nd Assistant | 3rd | 75 | None | | None | |

New Scale

| | A | | B | | C | |
|---|---|---|---|---|---|---|
| | License | Wage | License | Wage | License | Wage |
| Chief Operator | 1st | $125 | 2nd | $105 | 2nd | $105 |
| 1st Assistant | 2nd | 110 | 3rd | 85 | None | |
| 2nd Assistant | 3rd | 95 | None | | None | |

# Fuel Saving Devices for Marine Boilers

ADVICES from George Nicolas Ifft, American Consul, Bergen, Norway, state that Anders Strommen, a Trondhjem marine engineer, has invented and applied for American patents on two devices for obtaining more economical utilization of combustibles under marine boilers. The inventions consist of devices for use in connection with boilers as at present installed in steamships, one by the mounting of an auxiliary fire bridge at a certain distance in front of the old fire bridge, covering the part of the grate between the fire bridges with brick work or sheet metal and supplying combustion air in an upwardly directed current through openings in a horizontal covering plate extending rearwards from the top of the old fire bridge. Practical experiments have proved that it is possible by the simultaneous application of such arrangements to obtain a very considerable improvement in the economy of the boilers.

A second device, with the same end in view, consists of mounting the fire bridge a considerable distance in front of the rear end of the fire tube, whereby the grate surface is shortened and at the same time the rear part of the fire tube is partially shut off by means of a baffle wall extending downwards from the top of the fire tube wall to within a certain distance of the bottom thereof, by which means the combustion products are deflected downwards before leaving the fire tube.

These improved arrangements do not necessitate changes in the boilers and may be applied on any boiler. The inventor claims that, in actual tests, he has secured results from 20 tons of coal equivalent to those secured from 31 tons without his device; in another case from 10 tons results equivalent to 15 tons without his device and in a third, from 15 tons, results equivalent to 19 tons without his device, the tests being made with the same kind of coal and under exactly similar conditions.

# Todd School for Firemen

FREE courses of instruction for engineers and firemen in the safe and economical burning of fuel oil will be given by the Todd Shipyards Corporation at its manufacturing plant 742 East Twelfth street, New York City.

The courses will commence on August 1 and have been arranged by the Todd engineers because of the many careless and inefficient firemen working on oil burning vessels.

A few days' instruction by expert engineers, it is believed, will stimulate the interest of the men in their work and the additional knowledge they obtain will enable them to reduce the consumption of oil and thus increase the efficiency of the ships on which they work.

The courses will be along strictly practical lines and the time needed to pass an examination and secure a certificate will, of course, depend entirely on the ability of the student firemen. The instruction will include:

Maintaining a steady temperature and pressure on the oil.
Regulation of the air supply.
Judging conditions by the appearance of the flame.
How to clean strainers.
How to light burners.
When to clean burners.
How to correct the little troubles that occur in the average fireroom.

Shipowners are invited to enroll their engineers and firemen.

Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Questions and Answers Relating to Naval Architecture and Marine Engineering

**Conducted by James L. Bates, Naval Architect, and W. B. Newton, Marine Engineer**

*This department is maintained for the purpose of answering all questions relating to ships and their machinery. All inquiries should bear the name and address of the writer. Anonymous communications will not be considered. The identity of the writer, however, will not be disclosed unless the editor is given permission to do so.*

## Basic Design Problem

Q. (1,202).—I have carried out the course of procedure which you advocate in the June issue of MARINE ENGINEERING AND SHIPPING AGE, applying it to the tunnel stern vessel in the isue of April, 1921.

In preliminary calculations the value of

$$S \text{ corresponding to } \frac{2LAB}{H} \text{ is } S = 0.18$$

| Type of vessel—3 | | | | | |
|---|---|---|---|---|---|
| (ehp/E H P) g = | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| Fig. 8 v/V (type 3) | Beyond curve | | .666 | .683 | .703 |
| Value of v/V in article | .652 | .714 | .771 | .822 | .869 |

These values I find in the upper part of Fig. 8 for S = .19 labeled cavitating thrusts type 2.

Can it be that we are using two different charts, or that the captions on the charts are deceiving?

A. (1,202).—I am afraid the difference in your readings and mine can not be charged up to misleading captions, but rather to a mistake on my part in taking values of v/V from the Type 2 instead of from the Type 1 and 3 set of lines.

Since Fig. 8 was made a new chart was gotten out by Admiral Dyson separating entirely the Type 1 and 3 from the Type 2 cavitating lines, thus permitting v/V readings down to ehp/EHP = 0 for all types of vessels.

## Relative Values of Frictional and Residuary Resistance

Q. (1,206).—Please give me an idea of the relative values of frictional and residuary resistance in ships of several types.

A. (1,206).—The following data taken from page 202 Shipbuilding Cyclopedia, Edition 1920, may be considered as representative of the results obtained in modern ships:

| | *Percentage of* | |
|---|---|---|
| *Type of Ship* | *Frictional Resistance* | *Residual Resistance* |
| Destroyer | 41 | 59 |
| Light cruiser | 50 | 50 |
| Battle cruiser | 59 | 41 |
| Battleship | 63 | 37 |
| Troop transport | 69 | 31 |
| Fleet oiler | 70 | 30 |
| Cargo vessel | 75 | 25 |

## Passenger Capacity of Small Boat

Q. (1,205).—How many passengers may I carry on the deck of a 100-foot boat of good stability and freeboard and displacing in service condition from 70 to 80 tons without passengers?

A. (1,205).—The greatest danger in carrying passengers, particularly in a comparatively small boat, such as that described, is the possibility of their suddenly crowding to the rail and thus creating a large listing moment. To guard against serious results from this a large value of the metacentric height is desirable and a deck arrangement such as to restrain or hinder the transference of numbers of people from one side of the boat to another. Permanent ballast may be taken aboard to increase the metacentric height, if necessary.

If the boat was originally designed for passenger service, her metacentric height may be from 2 to 3 feet. Such a boat might safely carry 150 to 200 persons under ordinary river or harbor conditions. However, if the boat were not designed for passenger service and has but a small metacentric height —say one foot or fifteen inches, while she may have been very satisfactory in the service for which intended, she could perhaps carry with safety no more than 50 or 75 passengers, possibly even less.

Such a question can best be answered after a careful investigation of all the plans and stability data.

## Salt Water Unsuitable for Boiler Feed

Q. (1,207).—Is it possible to keep the scale and salt out of a boiler carrying 160 pounds pressure, if you use salt water for feed? If so, how?
H. E. McF.

A. (1,207).—The writer knows of no practical means of keeping the scale and salt out of a boiler while using salt water for feed.

If salt water could be used as boiler feed without deleterious effects, the design and construction of marine steam machinery would be materially simplified.

## Book on Anchors and Chain Cables

Q. (1,208).—Please give us the name of a book in which useful information regarding anchors and chain cables is given.

A. (1,208).—"Modern Seamanship" by Admiral Austin M. Knight, published by D. Van Nostrand Company, New York City, includes a valuable chapter on ground tackle. This chapter treats of types of anchors, old-fashioned and patent anchors, chain cables, details of cables, manufacture of cables, stowing, overhauling and make-up of cable, weight and strength of chain, windlasses, details of ground tackle, letting-go anchor, anchoring in squadron, anchoring in deep water, weighing, stowing of anchors, foul anchors, anchoring by the stern, riding at single anchor, advantage of long scope, dragging, mooring, advantages and disadvantages of mooring, clear and foul hawse, mooring swivel, tending ship, etc.

## Materials for Anchors and Chain

Q. (1,209).—What kind of iron is suitable for anchors and chain making and what method of forging is particularly needed?

A. (1,209).—At the present time for all chain of two inches and up the United States Navy is adopting cast steel except for shackles and swivels which are to be drop-forged of a special grade of steel having a high tensile and elastic strength combined with good ductility.

Cast steel chain has also been approved by the British and American Lloyd's and is coming into use in the merchant service.

Until very recently, however, all chain cables for ships have been made of wrought iron. This material has proven suitable through years of service and is only being replaced by cast steel because cast steel chain has shown 40 percent greater strength than the best wrought iron and because cast links are more uniform in size than the forged links.

Navy Department specifications for chain cable may be



Generated on 2024-09-12 16:22 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

secured upon application to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

Wrought chain for naval use is manufactured at the Boston Navy Yard. Information relative to the methods and processes of its manufacture should be obtainable therefrom.

## Measurements for "Full" Displacement

Q. (1,211).—In obtaining the various coefficients, does "full" mean to the greatest outside dimension of immersed plates, or does it mean the distance to the mean thickness?

A. (1,211).—When the final calculation for displacement is made the readings may be taken either from a body plan drawn to the mean thickness of plating or from a molded body plan. In the latter case the displacement of the shell plating is estimated as an appendage and added to that of the molded hull. By either method the displacement to the mean or average thickness of the plating is obtained. Therefore, it appears logical to measure dimensions to the mean thickness of plating when calculating the value of the block coefficient for "full" displacement. However, the error introduced by using the dimensions to the outer surface of the outer strakes probably would be less than that of a good displacement calculation itself. Since coefficients are generally used for purposes of comparison the important thing is to adopt a reasonable practice and follow it consistently.

## Length for "Full" Coefficient

Q. (1,212).—How is the "full" coefficient obtained, where the rudder, rudder post, propeller, etc., are included in the displacement? What length is used?

A. (1,212).—The rudder, rudder post, propellers, struts or bossing, bilge keels, etc., are usually considered appendages and their displacements are added to that of the hull proper. The augmented or "full" displacement thus obtained is used with the dimensions measured to the mean thickness of the plating. The term "full" coefficient then implies that the appendages have been considered. Theoretically the length should be taken from forward side of stem to after side of propeller or rudder post. However, no serious error (from the practical standpoint) would be introduced by using the molded length as above defined. As the coefficients of form relate essentially to the underbody proper, the inclusion of the appendages in the volume from which their values are figured is somewhat inconsistent though it is regularly done for purposes of convenience.

# NEW BOOKS

## Marine Directory

DIRECTORY OF SHIPOWNERS, SHIPBUILDERS AND MARINE ENGINEERS. Size, 5½ by 8½ inches. Pages, 728. The Directory Publishing Company, Limited, London, 1923.

We have just received the 1923 edition of the "Directory of Shipowners, Shipbuilders and Marine Engineers." This book, which is published annually, contains a list of the principal shipowners of the world with the addresses of their head and branch offices, the names of their ships and the names of their principal executives. It also contains a list of the shipbuilding companies with the names of their executives. This is followed by a list of consulting naval architects and marine engineers and also a list of trade organizations.

---

The Dock and Harbor Authority, London, has published a "Dock and Harbor Authorities' Directory" containing a list of the dock and harbor authorities throughout the world and of their principal officials.

# LETTERS TO THE EDITOR

## Cost of Ship Repairs

"Economy in Ship Repairs" by Mr. Robert Morell, and "Efficient Repair Methods Adopted by the United States Shipping Board" by Captain Gatewood, are two very interesting articles contributed by worthy students of their subjects. They give all that may be said from the operators' viewpoint, to whom cost of repairs represents at least 25 percent of their fixed charges. To cover the subject for the benefit of all concerned, it seems necessary to consider the repair plants, to whom cost of repairs represents 100 percent of their income. Unfortunately, successful managers of repair plants are too busy doing things to write about it, and in other cases the subject may be exceedingly painful. Having had charge of this all-important work in repair plants, as well as serving the owners in the capacity of consulting engineer on repairs, some facts may be of interest.

Economy in repairs should be studied and the high cost of repairs carefully diagnosed. Take the average shipowner; for a starter the owner personally attends to this all-important feature, but as his business grows and there is more money coming in from operation requiring his time, he spends less time and consequently more money on repairs. Rising cost of repairs causes him to make his best captain or his best chief engineer (sometimes both) remain ashore to enter the field of attending repairs. These good men, high class in their life's work as captain and chief engineer, respectively, immediately become involved in work far beyond their capacity—work that involves the expenditure of money, and they are pitted against the business end of a repair plant. It is almost unnecessary to dwell upon what happens.

The cost of a job may be known to the plant manager, but never to such an agent of the owner! The owner, therefore, gets a conglomeration of cost figures of jobs on his vessels, that would, if he could get the facts, cause a quick change to other means of attending this all-important end of his business.

There is no mystery in repair costs when one has had years of experience in costs from actual attention within the repair plant, but to expect a competent captain, or engineer, to step ashore and deal in a business that is so intricate as the repairing of a vessel, and report intelligently to its owner, is to expect something unattainable.

No owner objects to paying for work well done, or allowing a reasonable profit to be made by the repair plant, but the repair plant, forced to deal through such agencies, must protect these men in their mistakes, and both are guilty, therefore, of fooling the owner in the cost of such work. Both have good alibis. For example:

The owners' agent, having a ship repaired, overlooks essential features not included in the specifications or covered by one of those elegant and eloquent general clauses—naturally an *extra* is imminent.

God forbid any *extras!* The owners' agent is frightened into almost any method to avoid them. The repair man is asked to slip these extras in somewhere, on the next job, if necessary, thereby spoiling the opportunity of getting the real cost of any repair work on the vessel for the rest of its natural life. Neither the owners' representative nor the repair plant can report real facts to the owners for obvious reasons.

From years of experience I know wherein the cost of repairs from bills rendered has absolutely no relation to the real cost. Strange as it may seem, the cost of repairs is sometimes unknown even to the manager of the repair plant, so that the subject becomes exceedingly difficult to analyze.

Ships are as different as people and the cost of doing the

Generated on 2024-09-12 16:56 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

same job on different ships may in nowise be a true cost of that particular job, as there are so many contingencies that may, or may not, obtain. The best method requires fair dealing between the owners and repair plants and to my mind the owner who handles his repairs on the "live and let live" principle gets more for his dollar spent, and pays less for work done, than the "hard boiled" owner seeking to hook the repair plant on a low bid.

"Competition is the life of trade," but when competition places so valued a piece of property as a *ship* in incompetent hands, or in competent hands at too low a price, both of which comes from misguided competition, the trade becomes contaminated with a disease.

*The disease may be cured!*

Repair plants are as necessary as hospitals, and should be respected and encouraged as such. The prevailing attitude against all repair plants that classes the good, bad and indifferent plants and the poor, incompetent and irresponsible contractors in the same category should be eliminated.

Shipowners are operating ships to make money—they compete for cargoes on known costs of operation, so far as crew, food, fuel, insurance and overhead are concerned. They can only guess at cost of *upkeep* and *maintenance.* As repairs are unavoidable, and the cost of same a necessary item for the shipowner, more intelligence should be utilized in attending same. To know costs means closer relationship between *owners* and *repairs plants,* not through the good men previously mentioned, but through experienced men in such business.

Where owners use the right man in every branch of their operation, they use the wrong man in attending to their repairs. Any inexperienced man repairing a vessel at an established ship repair plant is doomed to incur excessive cost of repairs. There are many methods of hiding incompetency in the handling of this work—not because the incompetent man wishes to be dishonest—but it is unnatural for anyone to admit incompetency in his work, particularly where such admission may cause the loss of one's job; hence, there are many queer developments and excessive cost of jobs which are unnecessarily charged up against repair plants, and the regulation of such costs under the prevailing methods cannot be done.

The cost of such work continues to be unknown to the owner and will continue to be unknown to him just so long as present methods are used. Not until the business man, experienced in the cost of repairs, handles the repair work, so far as prices are concerned, for the owners, will the owners know the cost of such work! Considerable money may be saved by having such men attend this important feature and costs will be more properly distributed, giving thereby to the owner correct cost records.

Both Mr. Morell and Captain Gatewood are on the right track and quickly see wherein curative methods, or measures, may be effected; but it remains for most owners to realize that the best work his port captain and engineer can do is to see that the work required is properly covered, leaving the matter of cost to be handled by one who is experienced in such costs. The men to handle owners' costs are few and far between, but it remains for the owner to develop such men and to select them as they do their captains and engineers. Such men must have experience in the actual cost of repair work, and sufficient business acumen, to handle such an important business, and above all they must be of high character.

There can be no immediate result from these suggestions, but if we are to maintain our merchant marine and compete successfully for the world's transportation, some such method must be followed to realize, as soon as possible, such economies as may be effected in the cost of repairs, which will in turn lessen cost of operation.

EADS JOHNSON,
Consulting Marine Engineer,
New York.

## Duties of a Marine Superintendent

In the March, 1923, issue of MARINE ENGINEERING AND SHIPPING AGE is an article entitled "The Duties of a Marine Superintendent," which, being associated very closely with that profession, was of particular interest to me and I feel prompted to amplify this subject. The article referred to, excellent though it was, did not, to my mind, fully cover the scope of a marine superintendent's duties nor the responsibilities of the position, and the fact was not brought out that the position holds with it unlimited opportunities for high grade service.

A marine superintendent of the proper sort can and should make himself the most valuable man in a steamship organization. A marine superintendent, in the true sense of the word, is not merely a port captain or a ship's husband, he is an executive charged with the entire technical, mechanical and physical upkeep and performance of the fleet. Such a man, to properly fulfill his duties, must be a high caliber business executive in addition to his technical qualifications, and must possess a versatility required of few other professions. He need not necessarily be an "old-timer"; live-wire and up-to-date methods are needed in combination with sound judgment. It is not a prerequisite that a man shall have obtained all of his experience at sea. Shipyard experience is just about as valuable as sea experience, and a combination of both is most desirable. Shipyard experience gives one an insight into the world's best marine practice, brings contact with hundreds of different vessels and problems, affords a first hand knowledge of the principles of design, construction and repair, and familiarity with shipyard methods and costs.

Beyond the few duties mentioned in the March article, the real and essential duties of a marine superintendent embody the following:

Entire field of repairs and maintenance of the fleet.

Entire physical performance of the vessels, involving all matters pertaining to engineering economy, and efficient installation and operation of the ship's power plant and other equipment.

Manning of vessels, i.e., selection of competent officers and handling crew matters, wage scale, etc.

Regulation of deck and engine stores as to selection of materials and limiting their use.

Protecting owners' interests in all accident cases.

Decision on all matters of building, purchasing or converting vessels for owners' use, with respect to size, type, characteristics and details.

Advisory to the management on general operating policy.

The above is written in the hope that it may give some marine superintendent a vision of the scope of his position and his possibilities for usefulness; a realization of his responsibilities and what is expected of him; a sense of pride in doing something really worth while.

Also in the hope that some steamship management, if they have the right man as marine superintendent, will realize that his opinion and advice are invaluable and will consult with him fully. If the judgment of the marine superintendent cannot be trusted, he is not the man for the job; get rid of him and get a man big enough to entrust with the fleet and its welfare; then give him a free hand.

MARINE SUPERINTENDENT.

---

### Refrigerating Space Short in New York-Havre Service

Inability to obtain refrigerating space aboard ships plying in the New York-Havre service is ascribed as one of the reasons why the growing imports of frozen Canadian salmon into northern France are being transshipped through England.

Generated on 2024-09-12 16:50 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

## PERSONAL MENTION

L. J. DUGAN has been placed in charge of the new offices of the Williams Line in Seattle, Wash.

J. R. EDWARDS has been appointed New York representative of the United States Barge Corporation of New Jersey.

ALBERTO DELLA RAGIONE has been appointed non-exclusive surveyor for the American Bureau of Shipping at Fiume, Italy.

W. B. KEENE, director of traffic, and Sidney Henry, director of sales, are now vice-presidents of the Emergency Fleet Corporation.

J. Y. S. MITCHELL, commercial agent, has been placed in charge of the new office of the Garland Steamship Corporation in Norfolk, Va.

EDWARD J. MEURER, for the past sixteen years connected with the W. & A. Fletcher Company, is now connected with the Perth Amboy Dry Dock Company.

EDWARD LOVERING, treasurer of the Massachusetts Cotton Mills, has been elected a director of the Eastern Steamship Company, succeeding J. B. Hardon, resigned.

NORRIS R. SIBLEY, formerly with the London Steam Turbine Company, has assumed new duties as representative of the firm of McClave-Brooks Company, 461 Eighth Avenue, New York.

J. B. SMULL, who recently retired as president of the Emergency Fleet Corporation, will resume activities on September 1 as a member of the firm of J. H. Winchester & Company, ship brokers and steamship agents.

ALFRED W. PARRY, JR., of the Tampa Interocean Steamship Company, has been elected chairman of the Far Eastern Freight Conference for the next three months, succeeding Edward C. Trainor, of the Nippon Yusen Kaisha.

ARTHUR C. BESSELIEVRE, at present with the United States Shipping Board, has been appointed professor of naval architecture, and Frank L. Odell has been appointed resident manager of the Webb Institute of Naval Architecture at Fordham, N. Y.

W. D. BENSON, formerly secretary of the Trans-Pacific Westbound Conference, has been named Seattle and Northwest agent for the Transmarine Corporation, which has inaugurated another intercoastal service from Port Newark to Seattle.

FLOYD N. BUSH has been appointed northwest manager of Sudden & Christenson, with offices at Seattle, his successor at Portland, Ore., being H. T. Anning, formerly in charge of the Portland office of the defunct Atlantic, Gulf & Pacific Steamship Corporation.

JOSEPH W. NEWBY, vice-president of E. E. Palen & Company, steamship agents, has been appointed general agent of the Old Dominion Transportation Company, at Norfolk, Va. Mr. Newby has been associated with the Old Dominion Steamship Company for twenty years. He will relinquish his active duties with E. E. Palen & Company, but will retain an interest and directorate in that company.

ARTHUR FLETCHER, of the W. & A. Fletcher Company, of Hoboken, N. J., in company with A. W. Preston, president of the United Fruit Company; Captain A. F. Davison, general manager of the marine department, and Mr. Moore, marine superintendent, sailed from Boston, on July 12, on the Cunard Liner *Samaria* for England. The purpose of the trip is to be present at the launching of the new steamship *La Playa* which has just been finished for the account of the United Fruit Company by Messrs. Cammel Laird of Birkenhead, England, and is of the advanced Diesel electric drive design. The members of the party will return together to New York upon the new vessel.

J. BARRAJA-FRAUENFELDER, naval architect and marine engineer, who for the past nine years has had supervision over the high speed Diesel engine installations for the United States submarines built by the Lake Torpedo Boat Company, at Bridgeport, Conn., has resigned as chief engineer of that company. Mr. Frauenfelder has been retained by the Sun Shipbuilding and Dry Dock Company, of Chester, Pa., in the capacity of consulting Diesel engineer to undertake the development of the Sun-Doxford opposed piston Diesel engines for various commercial purposes.

## OBITUARY

PETER CAHILL, eighty-two years old, founder and head of the Cahill Towing Line, Inc., died at his home in Brooklyn, N. Y., on July 18. Mr. Cahill was born in Rochester in 1841, spending his early days in that city and later in trade on the Erie Canal. He was a member of the National Board of Steam Navigators and also of the Maritime Association.

DAVID RODGERS, the best known shipbuilder on the Pacific Coast, died in Seattle, Wash., on June 25. Mr. Rodgers made an international reputation for speed in building ships during the war when he was superintendent for the Skinner & Eddy Corporation. In fact, it was probably the strain of his war-time efforts that caused his death for he had not been well for some time. Mr. Rodgers knew personally so many skilled workmen in the shipbuilding business that when the emergency building began he had little difficulty in securing the organization that helped him to make his wonderful record. Joseph E. Sheedy, vice-president, United States Shipping Board Emergency Fleet Corporation, has paid the following tribute to Mr. Rodgers:

"When the dreadful effect of the submarine employed by the Germans began to be felt so seriously and the world recognized the necessity of producing tonnage in ever-increasing amounts, it was Mr. Rodgers who first thrilled the country by delivering a complete 8,800-ton steel ship in 65 days—a year being required in pre-war days for this task.

"He thus set the pace for American yards in the production of ships, which later gained such headway that we were relieved of the frightful menace that threatened to cut off all assistance that we might render in the prosecution of the war.

"The first direct contract steel ship delivered to the United States Shipping Board was built by Mr. Rodgers and named the *Seattle*.

"Though he never sought to build ships in record time, just for the sake of establishing a record, he kept consistently cutting down the time of delivery of each vessel until he finally established 55 days as the construction time from keel laying until delivery of one of these huge vessels.

"When Mr. Rodgers was in Washington, in 1918, President Wilson sent for him and warmly congratulated him upon producing the most essential instrument of war in the record time that he had established.

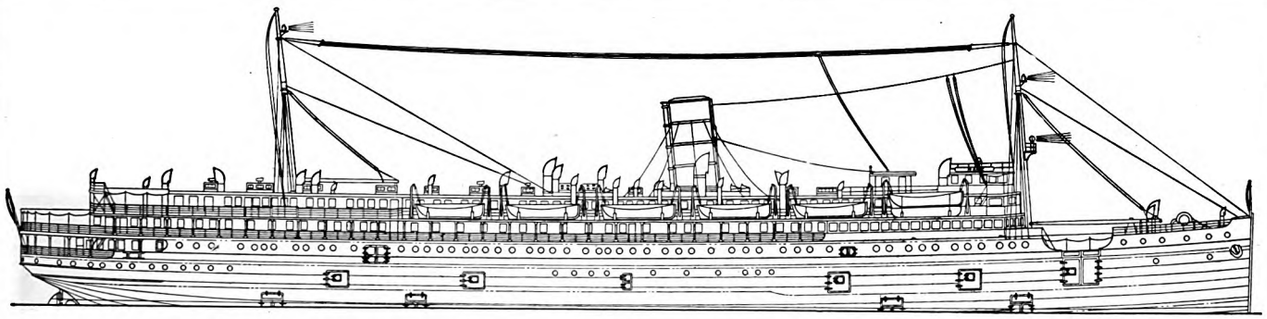
"The United States Shipping Board in its untiring efforts to obtain tonnage at that time, awarded the pennant each six months to the shipyard delivering the greatest amount of tonnage based upon the number of building ways they occupied, and the Skinner & Eddy Corporation, under Mr. Rodgers' management, won this pennant on every occasion.

"Mr. Charles M. Schwab, when director general of the Fleet Corporation, named him the *Master Shipbuilder of the World.*"

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# The Month's Shipping and Shipbuilding News in Brief

**Shipyard, Steamship and Port Activities and Other Notes of Interest in All Branches of the Marine Industries**



Outboard Profile of Type "A" Ship Proposed for Clyde Line and Designed by Theodore E. Ferris

## New Steamer Under Consideration

ACCORDING to well-informed circles in the shipping district, the Bridgeport and Port Jefferson Steamboat Company has in contemplation the construction of a new steel steamer for the route between Bridgeport, Conn., and Port Jefferson, New York. George M. Tooker, of Port Jefferson, is superintendent of the line. It is understood that a New York naval architect has been consulted in connection with the preparation of plans and specifications.

It is believed that a vessel having an overall length of about 165 feet will be required and the propelling machinery will probably be either turbine or reciprocating engines. The line deals principally with the carrying of passengers and automobiles and a steamer to meet the new requirements will cost approximately $175,000.

## Bids August 13 at Nashville, Tenn., for Two Derrick Boats

THE United States Engineer Office, Nashville, Tenn., will receive sealed proposals until 11 A. M., August 13, for the construction of two derrick boats with derricks. The vessels are to have a length molded of 76 feet 6 inches, beam 34 feet, depth molded at gunwales 5 feet. The hulls are to be built of steel, each to have two transverse watertight bulkheads.

Forward, there will be two spud wells built into the hull near the gunwales, the wells to be 20 inches by 20 inches in the clear and one spud well will be built aft to be 15 inches by 15 inches in the clear. A total of 49 complete sheaves with bushings and 12 extra complete sheaves with bushings are to be supplied.

The boom is to be 78 feet between end pins with a 14-foot removable section in the middle. The bull wheel will have an effected diameter of 16 feet and the "A" frame heads shall be about 43 feet 3 inches above the top of the deck.

## Bids for Construction of New Clyde Passenger and Freight Ships Received

PROPOSALS for the construction of two combination passenger and freight ships for the Clyde Steamship Company were received at the office of Theodore E. Ferris, naval architect and marine engineer, 30 Church street, New York, on Monday, July 23.

Two sets of plans and specifications were given to bidders, who submitted prices for two Type "A," or large sized ship, driven by turbine engines, and two Type "B" steamers, equipped with either reciprocating or turbine propelling machinery.

### Dimensions

The principal dimensions of each type of ship are as follows:

"A" Type

| | |
|---|---|
| Length overall | 425 feet 6 inches |
| Length between perpendiculars. | 410 feet 6 inches |
| Length for displacement | 405 feet |
| Beam molded | 55 feet 9 inches |
| Depth molded to hurricane deck at side | 32 feet 9 inches |
| Depth molded to main deck at side | 24 feet 9 inches |
| Sheer forward | 7 feet |
| Sheer aft | 3 feet 6 inches |
| Designed load draft | 18 feet 9 inches |
| Deadweight carrying capacity | 3,160 tons |
| Cargo, cubic capacity | 313,000 cubic feet |
| Speed | 14¼-15½ knots |

"B" Type

| | |
|---|---|
| Length overall | 402 feet |
| Length between perpendiculars. | 387 feet 6 inches |
| Length for displacement | 382 feet |
| Beam molded | 54 feet |
| Depth molded to hurricane deck at side | 31 feet 6 inches |
| Depth molded to main deck at side | 23 feet 6 inches |
| Sheer forward | 6 feet 9 inches |
| Sheer aft | 3 feet 4 inches |
| Designed load draft | 18 feet |
| Deadweight carrying capacity | 2,650 tons |
| Cargo, cubic capacity | 286,000 cubic feet |
| Speed | 15 knots |

The "A" type ships are to be equipped with geared turbine engines developing 4,750 shaft horsepower, turning a single screw, while the "B' type ships are to be driven by either geared turbine or reciprocating triple expansion engines, developing 3,900 shaft horsepower and also turning a single screw.

### Passenger Accommodations

The larger ship will carry only one grade of passengers—first class in rooms and steerage passengers with men berthed in open spaces and women in a limited number of rooms. The first class passengers in rooms will be about as follows: two special suites with parlor room and connecting bath (4 or 6 passengers); 16 regular suites with connecting bath (32 or 48 passengers); 16 special rooms with settee, berth and connecting toilet (32 or 48 passengers); 10 special rooms with connecting toilet, no settee berth (20 passengers); 48 regular staterooms, no settee berth (96 passengers); making a total of 150 rooms for the accommodation of from 300 to 392 passengers.

The special suites are to be fitted with twin beds and Pullman folding berth over the inboard bed; four of the regular suites are to be fitted with one double bed with Pullman berth over, and twelve regular suites are to be fitted with twin beds and Pullman folding berth over inboard bed. All special staterooms are to be fitted with settee berth, while all regular staterooms will be fitted with lower and upper metal



Generated on 2024-09-12 16:21 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

bed in one unit. The total steerage passenger capacity will be 102.

GENERAL DESCRIPTION

The "A" type ship will be of the three-deck, hurricane deck, coastwise type, with forecastle, deck well, bridge enclosure and continuous deck erections aft, with complete double bottom; and will have lower main, hurricane, promenade and boat decks. The ships will have two steel pole masts, forward mast fitted with cargo booms and main mast fitted with a small boom, and will have one smokestack. There are to be seven watertight steel bulkheads, all extending up to the main deck and three of which, including the collision bulkhead, will extend to the hurricane deck, forming eight transverse watertight compartments. The engine and boiler enclosures will be built of steel, extending to above the top of the boat deck house. The deck house and the hurricane deck will be of steel construction and the remaining deck erections, including the entire house on the promenade deck, boat deck, wheel, chart and wireless house, will be built of wood. The ship will be equipped with fans, motors and metal ducts, intake and exhaust fans to mechanically ventilate on the balance system to the upper and lower 'tween decks in cargo spaces.

The fore peak tank will be used for fuel oil and for salt water trimming tank. The after peak tank will be used for salt water trimming tank and will also be piped for fresh water, while the double bottom tanks will carry fuel oil, water ballast and boiler feed. Culinary water, or ship tanks, will be built in aft of the ship's engine space and at each side of the engine room between the double bottom and lower deck, the deep fuel oil tanks to be built in at each side of the boiler room between the double bottom and main deck. Steam cargo winches with cranes will be fitted at all blind hatches (five in number on the main deck) and steam winches will be fitted forward on the main deck for working the forward cargo booms.

Amidships on the main deck will be the galley, scullery, bake shop, mess room, storerooms, wash and toilet rooms, firemen's quarters, lamp room, trunk room, dog kennel, drying room, and stewards' cold storage rooms. Aft on the main deck will be waiters' quarters and wash rooms, men's steerage quarters and toilets and steering engine room.

PROPULSION

The propelling machinery will consist of double reduction geared turbines, steam being supplied by four single-ended Scotch boilers, fitted for burning oil fuel, arranged in one fireroom, together with all necessary auxiliaries. Other equipment will include electric light and power plant, cold storage system, steam winches, steam capstans, steam windlass, steam and auxiliary steering gear, emergency lighting set, wireless equipment, mechanical ventillating system, heating system and complete ballast and draining system.

In the case of "B" type ships the construction, general appearance and arrangements will be very similar to those of the larger ship. Their passenger capacity will be approximately 116 rooms for a total of between 252 and 306 first class passengers and 86 steerage passengers.

---

THE BRUNSWICK-KROESCHELL COMPANY is erecting new brick and concrete factory buildings at a cost of approximately $500,000 at Diversey Avenue and the Chicago, Milwaukee and St. Paul right-of-way in Chicago.

# Shipyards Requested to Consider Completion and Conversion of Three Southern Built 7,000 Ton Steamers

ANNOUNCEMENT is made by the firm of Whittlesey & Whittlesey, naval architects and marine engineers of 17 Battery Place, New York, of the disposition of three 7,000 deadweight ton steel cargo vessels which are in various stages of completion for the Italo-American Finance Corporation, to Callahan & Atkinson Company of 17 Battery Place. The vessels are the *Torino, Trento* and *Trieste*. The sale completes the liquidation of the International Shipbuilding Company's plant at Pascagoula, Miss.

Callahan Atkinson Company have sent a letter to various shipbuilders, which reads in part as follows:

"We give you below the information regarding the above vessels which were built under the supervision of Lloyd's and the Bureau de Veritas at Pascagoula, Miss., which are now available for inspection and sale. The dimensions of the vessels are as follows: 385 feet 9 inches overall, 52 feet molded breadth, 27 feet 6 inches molded depth. They are designed to carry 7,000 tons deadweight on 22 feet draft.

"Hull No. 1 (the *Torino*) has reciprocating engines and Scotch boilers, and it is estimated that there is sufficient equipment available to complete the steamer. Hulls Nos. 2 and 3 (the *Trento* and *Trieste*) have considerable equipment aboard and in the yards and they are adaptable for completion as motorships. It is estimated that they will carry about 7,500 tons so completed. All can be converted into barges with an estimated capacity of about 8,000 tons.

"If you can interest any of your clients we may arrange to defer payment for these hulls until they are ready for service and we may further extend financial assistance to approved buyers. We would also consider the completion sale of these vessels on a co-operative basis, the value of the ships and material and your cost of completion being subject to mutual arrangement. These vessels, when completed, should be very desirable as colliers or for the carriage of cargo such as ore, lumber, coal, etc., on account of the shallow draft of 22 feet. The above ships represent an original investment of several millions of dollars and are offered at considerably less than the current price of tonnage."

Invitations are extended to the shipyards to have representatives inspect plans, specifications, blueprints and photographs in order to develop some plan for the completion of the ships under terms that may be mutually agreed upon.

## Southern Pacific Plans Building of Two New Steamers

PLANS and specifications are expected to be completed in about a month for the construction of two combined passenger and freight ships for the Southern Pacific Steamship Company. It is believed the vessels will be used in the company's southern service.

## Sullivan Company to Build New Tug

THE contract for the construction of a 95-foot steel, oil burning tug for the Southern Pacific Company has been awarded to John W. Sullivan Company, on a bid of $112,500, and 7 months' time. Tenders were opened by A. S. Hebble, Superintending Engineer of the Southern Pacific Company, on July 17, with the following results:

| | | |
|---|---|---|
| John W. Sullivan Co... | $112,500 | 7 months |
| Federal Shipbuilding Co. ..... | 129,000 | 180 days |
| Staten Island Shipbuilding Co. ..... | 129,900 | 180 days |
| Tebo Yacht & Basin Co. | 135,560 | 185 days |
| Bethlehem Shipbuilding Corp. ..... | 175,000 | 8 months |
| Sun Shipbuilding Co... | 187,248 | 195 days |

# West Coast Yards Bid for Over $200,000 Worth of Reconditioning on Point Bonita and Point Adams

AT the opening of bids submitted for reconditioning the steamers *Point Bonita* and *Point Adams*, under optional purchase by the Hammond Lumber Company from the Pacific Mail Steamship Company, the lowest tender was in excess of $100,000. The vessels are considered well suited for the coastwise lumber trade, to which service they are to be assigned by the Hammond Lumber Company, if purchased by them. The purchase price has not been revealed.

The Bethlehem Shipbuilding Corporation submitted the lowest bid on the reconditioning of the steamer *Point Bonita*, while the Moore Shipbuilding Company was low bidder for repairing the *Point Adams* for the coastwise lumber trade.

The prices submitted for the *Point Adams* were: Moore's, $111,034 and 50 days; Bethlehem, $115,136 and 52 days; Hanlon's, $116,512 and 50 days; General Engineering, $118,210 and 50 days; Los Angeles Shipbuilding Company, $118,700 and 60 days, and United Engineering, $120,250 and 60 days.

On the reconditioning of the *Point Bonita* the tenders are: Bethlehem, $103,680 and 48 days; Moore's $106,028 and 50 days; General Engineering, $106,410 and 50 days; United Engineering, $108,000 and 50 days; Los Angeles Shipbuilding Company, $111,350 and 50 days, and Hanlon's, $114,880 and 50 days.

The work on both ships calls for the cutting off of the shelter decks, completely overhauling engines and boilers, installing cargo gears and winches and carrying out other work, generally fitting them for the coastwise lumber trade.

Generated on 2024-09-12 16:19 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

## Hamburg-American Steamer Cleveland Bought by U. A. L.

THE report that the Harriman interests are about to acquire the former Hamburg-American Line steamer *Cleveland* has been confirmed by R. H. M. Robinson, president of the American Ship & Commerce Corporation and the United American Lines. Mr. Robinson said that the American Ship & Commerce Corporation had been in negotiation for the purchase of the ship and that these negotiations were practically completed. The sellers are the Byron Steamship Company, Ltd., of London, who have been running her recently under the British flag as the *King Alexander*.

Mr. Robinson said that the liner would be operated by the United American Lines and that she would be employed as a cabin ship in the New York-Hamburg service under her former name, *Cleveland*. He said:

"While the *Cleveland* has always carried first, second and third-class passengers and is excellently equipped to do so, it is our plan to convert her into a cabin class steamer and to make her one of the most up-to-date vessels of that type afloat. She will be thoroughly reconditioned and is expected to go into service in about two months."

The *Cleveland* is a twin-screw steamer of 17,000 gross tons, and is well known to the American traveling public, having been employed by the Hamburg-American Line in the North Atlantic service and also for round-the-world cruises.

The United American Lines maintain joint services with the Hamburg-American Line. Three first-class ships, the *Resolute, Reliance* and *Albert Ballin*, are now in service between New York and the channel ports and Hamburg, and this number will be increased to four when the new *Deutschland* is completed later in the year. The cabin service between New York and Hamburg, heretofore maintained with the *Hansa, Thuringia* and *Westphalia*, will be increased to four ships by the addition of the *Cleveland*. An exclusive third-class service is also maintained, with the steamers *Mount Clay, Mount Clinton* and *Mount Carroll*.

## Two Navy Ships to be Fitted Out in September

The Navy Department at Washington has announced that the new battleship *West Virginia*, being built at Newport News, will be sent to Norfolk to be "fitted out" as soon as she is turned over to the department. The *West Virginia* will probably be ready for the finishing process by September.

Admiral Andrews, commandant of the Fifth Naval District, stated recently that the Navy Department expected both the *West Virginia* and *Colorado* to be ready for the final stages of fitting out by September. Both ships will stop at the Brooklyn yard for installing of fire control apparatus before going to navy yards for the final process.

The Newport News Shipbuilding and Drydock Company has charge of the building of the *West Virginia* and the *Colorado* is at Camden, N. J., the work being done by the New York Shipbuilding Company. The *Colorado* will go to Philadelphia to be finished after being turned over to the Navy.

## Eight Companies Bid for Six Scow Construction Contract With Pittsburgh Yard Low at $113,220

THE Dravo Contracting Company of Pittsburgh, Pa., submitted the lowest bid for the construction of six steel dump scows at the opening of tenders by the United States Engineer Office, Louisville, Ky., on July 16. A variety of prices were asked and eight companies submitted proposals for the work as follows:

| | One scow | Two scows | Three scows | Four scows | Six scows |
|---|---|---|---|---|---|
| American Bridge Co. | ..... | ..... | ..... | ..... | $145,500 |
| Nashville Bridge Co. | $28,940 | $57,880 | $86,280 | $114,680 | 170,940 |
| Independent Bridge Co. | 27,200 | 49,700 | 71,400 | 92,300 | 134,900 |
| Dubuque Boat & Boiler Works. | 24,800 | 46,800 | 68,400 | 90,000 | 133,000 |
| Treadwell Construction Co. | ..... | ..... | ..... | 93,000 | 138,000 |
| Penn Bridge Co. | ..... | ..... | ..... | ..... | 137,250 |
| Dravo Contracting Co. | 20,500 | 39,540 | 58,410 | 77,080 | 113,220 |
| General Contracting Co. | ..... | 30,000 | ..... | ..... | *..... |

*Informal bid.

## Chas. Ward Low Bidder for Steel Stern Wheel Tug

THE Charles Ward Engineering Works, of Charleston, W. Va., with a price of $164,000, submitted the low bid for the construction of a steel hull stern wheel towboat, bids for which were opened at the United States Engineer Office, Nashville, Tenn., on July 16. There was one other bidder, the Dravo Contracting Company, of Pittsburgh, Pa., who offered a price of $189,000.

The proposed boat is to have an overall length of 136 feet 7½ inches, breadth molded 29 feet, the propelling machinery to be of the surface condensing tandem compound type, designed for a working pressure of 250 pounds per square inch, the vessel to be modernly equipped throughout.

## Bidders for Building 14 Steel Barges

THE Mississippi River Commission, First and Second Districts, Room 1006 McCall Building, Memphis, Tenn, received sealed proposals on July 18 for the construction of fourteen steel barges, the Dravo Contracting Company, of Pittsburgh, offering the lowest figure of $192,500. The proposed barges are to have a length of 120 feet, beam 30 feet.

The tenders submitted were as follows:

| | |
|---|---|
| Dravo Contracting Co. | $192,500 |
| American Bridge Company | 197,400 |
| Midland Barge Company | 207,200 |
| Independent Bridge Company | 212,730 |
| Ritter Conley Manufacturing Co. | 212,800 |
| Penn Bridge Company | 224,140 |
| Nashville Bridge Company | 249,740 |
| Dubuque Boat & Boiler Works | 297,000 |
| Sun Shipbuilding & D. D. Co. | 310,000 |

## Construction and Equipment of Pier Shed to Cost About $889,000; Proposals to Be Taken July 30

THE Commissioner of Docks of the City of New York received bids until July 30 for the construction and equipment of the West 44th Street Pier Shed, North River, Borough of Manhattan, under Contract 1,810, the total estimated cost being approximately $889,000. The work is to be divided into eight separate contracts as follows:

| Contract | | Estimated Cost |
|---|---|---|
| A | Construction of Pier Shed | $713,000 |
| B | Elevators and Appurtenances | 58,000 |
| C | Baggage Conveyors | 9,000 |
| D | Gravity Chutes | 12,000 |
| E | Sprinkler Systems | 39,000 |
| F | Steam Heating | 11,000 |
| G | Plumbing and Water Supplies | 20,000 |
| H | Electric Wiring and Fixtures | 37,000 |

## City Considering New Ferry Plans; Steamer Bought

THE Department of Plant & Structures of the City of New York submitted to the Board of Estimate & Apportionment, recently, new plans and specifications for the construction of eight steel ferryboats, these plans and specifications now being under consideration by that board.

The Department of Plant & Structures has purchased the steamship *Colonel Clayton*, which was built for the Government during the war for inland river service but was not used. The vessel is 130 feet in length and has been bought to replace the city institutional steamer *Correction*. The *Colonel Clayton* has been awarded to the Verdon Shipbuilding Company, Staten Island, for reconditioning at a cost of about $10,000, the total purchase and repair price being $50,000.

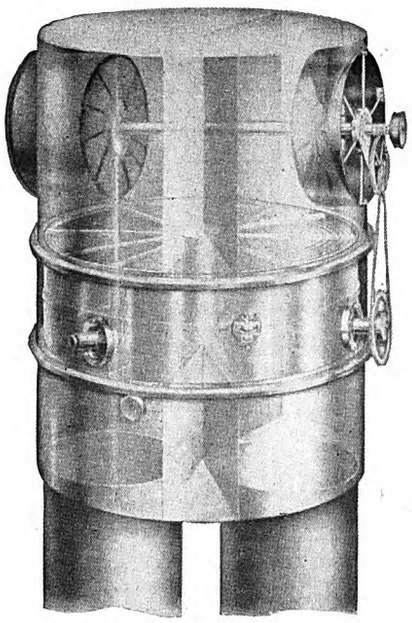
## New Million-Dollar Terminal Project is Planned at Norfolk

THE Mallory and Gulf & Southern Steamship interests have purchased 1,200 feet of the Hendry & Knight terminals, at Tampa, Fla., from the Carew Land Company, the purchase price and contemplated improvement entailing an outlay of about $1,000,000. This sale is probably the largest and also the most important waterfront transaction yet made in Tampa.

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

## American Firm to Manufacture Ljungstrom Air Preheaters

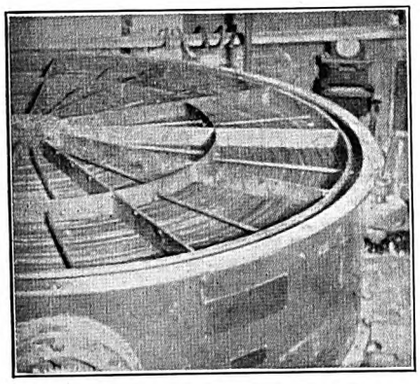
ARRANGEMENTS have recently been made by James Howden & Company of America, Inc., in conjunction with James Howden & Company, Ltd., Glasgow, Scotland, for the sole marine license of the world to manufacture the air preheater developed



Phantom View of Preheater

by Frederick Ljungström, Stockholm, Sweden. In this country the preheaters will be made at the Wellsville Works, New York, of James Howden & Company.

The advantages of preheaters in general are well known and, for some time past, air preheaters have been used in conjunction with the Howden system of forced draft. Up to the present development, such air preheaters have generally operated on the



Rotor with Heating Elements

principle of transmitting the heat from the waste gases to the air through metallic surfaces separating the air passages from the flues. Under these conditions, heat transmission is not very effective, as the temperature difference is not great and the surfaces of the heating device have a tendency to become covered with a layer of soot or tarry matter which acts as a non-conductor.

In the Howden-Ljungström preheater, the assembly of parts is such that a large transmission surface is assembled in a rotating unit so that the elements are traversed first by the waste gases from the boiler and then by the cold air used for combustion. The gases give up their heat to the elements and as they move into the current of cold air, the stored heat is transferred to the air.

### Operation of Preheater

Referring to the phantom view of the preheater, fresh air is drawn by a fan into the upper portion of the casing, which is divided into two parts by a vertical partition. The air is confined to one side of this partition and passes downward through a similar semi-circular chamber through the body of a porous cylindrical rotor. The flue gases from the boiler traverse the apparatus in the reverse way, entering the lower semi-circular chamber and passing upward through the rotor to the upper chamber, where they are exhausted and impelled to the stack by another fan. The rotor is kept in a state of continual rotation so that the portion heated by the flue gases is continually passing to the other side of the device and giving up its heat to the cold air sweeping through it.

Since there is no transfer of heat through metal in the process, the deposits of soot and tarry matter do not seriously affect the operation of the apparatus, which, moreover, may be cleaned readily by means of a steam jet.

The rotor is built of thin sheet steel and is divided into sections by radial plates which serve as stiffeners. In each section the heat elements, consisting of special corrugated plates alternating with plain plates, are placed concentrically, thus forming when assembled a honeycomb type of structure. This design allows liberal heating surface to be provided in a heater of comparatively small dimensions and with slight obstruction to the passage of the gases and air. On the outside of the rotor a heavy steel ring is fastened against which the carrying and guide rollers work. The integral fans are fitted on a common shaft and the required speed of the roller, about six revolutions a minute, is obtained by means of suitable gearing connecting the fan shaft with the driving roller. The rollers carrying the weight of the rotor are mounted on ball bearings so that the amount of power required for driving purposes is very small.

It is claimed that from 70 to 75 percent of the heat contained in the waste gases, depending on conditions, can be recovered with the Howden-Ljungström preheater, a result which is impossible unless with a type having a large extension of the heating surface which can only be made at the expense of space and weight as well as first cost.

Test figures from a Scotch boiler burning both coal and oil and fitted with this type of air preheater show exceptionally high boiler efficiencies, ranging from 84 to 87 percent.

## S. S. Porto Rico to Be Converted for Refrigeration

BIDS were opened last month by the New York & Porto Rico Steamship Company for the conversion of the steamship *Porto Rico* into a refrigeration ship, the work to be done being similar to that recently carried out on the company's steamship *San Lorenzo*. It is expected that the contract will cost over $100,000 and that another of the line's steamers will undergo similar reconditioning at a later date. Specifications for the *Porto Rico* were issued by Theodore E. Ferris, naval architect, of 30 Church street.

## TRADE PUBLICATIONS

Hydraulic Riveters.—Riveters, hydraulicly actuated, applicable to all kinds of ship, plate, tank and boiler work, are described in a bulletin issued by the Hanna Engineering Works, Chicago, Ill. Illustrations and descriptions of riveters, both regular and special types, are given in sizes from the 6-inch reach, 8-inch gap, 15-ton capacity, forged nose riveter to the 126-inch reach, 18- to 24-inch gap, 80-ton capacity boiler riveter.

Boiler Tube Cleaners.—A conveniently indexed catalogue descriptive of boiler tube cleaners has been sent out by the Roto Company, Hartford, Conn. Some of the sections into which the catalogue are divided deal with cleaners for watertubes, arch tubes, fire tubes, with condenser tube cleaners, various type motors used, accessories and repair parts.

Electric Steel Castings.—A group of bulletins outlining the process of manufacturing electric steel castings and their application in industry has been collected in binder form for distribution by the Nugent Steel Castings Company, Chicago, Ill., formerly the Electric Steel Company.

Sand and Gravel Dredges.—Bulletin F-196, illustrating and describing the elevator type sand and gravel dredge designed and built by Ellicott Machine Corporation, Baltimore, Md., has recently been published by this concern. In addition to general details and specifications of the dredge, including arrangement drawings, an outline of special machinery installed, including excavators' screening machinery, winding machinery, pumps and auxiliaries is also given.

Loud Speaking Telephones.—The marine type Callophone designed for service on board ship, in mines, tunnels and in other places where a watertight and non-corrosive equipment is required is described in a pamphlet sent out by the Callophone Company of New York. Specifications, wiring diagrams, methods of operation with suitable illustrations explain this system.

Steam Driven Compressors.—The Ingersoll-Rand Company, 11 Broadway, New York, has just issued a 36-page bulletin describing "Imperial" type XPV Steam Driven Air Compressors. This compressor is built in a number of different types and sizes. Standard two-stage machines for 100 pounds discharge pressure, range from 246 to 4,150 cubic feet per minute piston displacement. Single-stage compressors are built for furnishing air up to 50 pounds discharge pressure. One of the outstanding features of type XPV compressors is the automatic cut-off governor which regulates the compressor. Other features of design which are illustrated and described in detail include the Ingersoll-Rand plate air valves which are used for both intake and discharge; the unit construction which requires a very simple foundation; and the automatic flood system of lubrication.

Multistage Series Pumps.—A new style of centrifugal pump, called a "series pump," is described in a catalogue just issued by the De Laval Steam Turbine Company, Trenton, N. J. In this pump double suction impellers and volute diffusers are used, as in single stage centrifugal pumps. The connecting passages from stage to stage, however, are included in the pump case casting, as in the ordinary multistage pump. The advantages claimed are perfect hydraulic axial balance and high efficiency under varying loads, as is characteristic of the single stage pump.

Generated on 2024-09-12 16:24 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Foreign Shipping and Shipbuilding Activities

## Semi-Diesel Engines Installed in Cargo Ship Margretian

TWO 600 horsepower marine oil engines of the semi-Diesel type have recently been installed by Messrs. William Beardmore & Company in the twin screw general cargo ship *Margretian* of Cardiff. The *Margretian* is of 6,525 tons displacement, 310 feet overall length, designed for a service speed of 10½ knots.

### A New Development

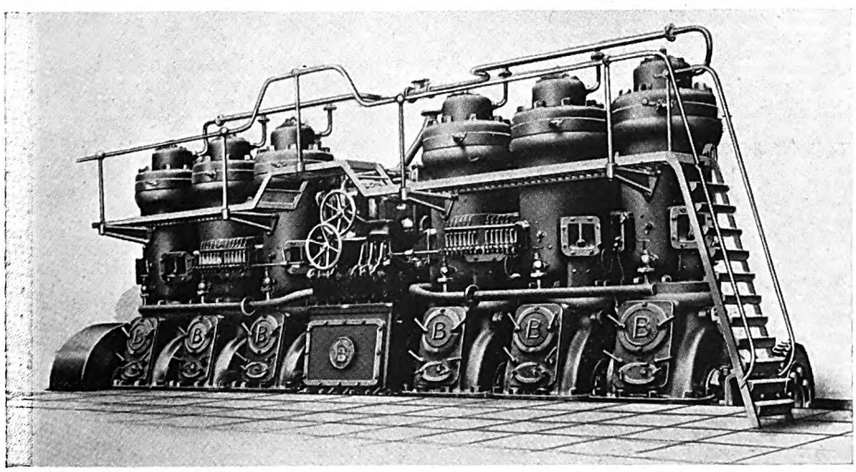
This installation marks an epoch in the development of the semi-Diesel engine for it is the first attempt that has been made to build other than comparatively low power units of this type. The new type Beardmore engine consists of six cylinders each 18 inches diameter by 24 inches stroke, and is rated for 600 brake horsepower at 185 revolutions per minute. Each engine is 22 feet 6 inches in overall length, 5 feet 6 inches maximum width and 7 feet high above the floor plates. It weighs complete, with flywheel, silencer and exhaust pipes, about 45 tons.

The engine is of the two cycle type, with crank case compression and port scavenging, and has forced lubrication to all bearings, including the pump gear. The engine drives all its own auxiliaries, with the exception of the air compressor which provides the starting air.

### Special Features

The lubrication of this engine has received special consideration, and, contrary to the usual practice with crank case compression machines, the crank shaft bearings have forced lubrication. The oil is delivered at 6 to 10 pounds per square inch to the main bearings. From there it is fed through the shaft to the big end and thence up the connecting rod to the gudgeon pin. The return oil is led to the service tank, where it is filtered and cooled before being returned to the engine. The pistons and cylinder walls are lubricated by mechanical sight feed lubricators worked by the engine.

So far as simplicity is concerned, this engine is the equal of earlier semi-Diesel types.



600 Horsepower Beardmore Marine Semi-Diesel Engine

## French Line Plans Construction of Two Large Transatlantic Liners; Company Passes Regular Dividend

**By Our Paris Correspondent**

CONSIDERABLE interest has been aroused in France by the general ordinary meeting of shareholders of the Compagnie Generale Transatlantique (French Line) which was held on June 29, as apart from the questions directly connected with the management of the company in the course of 1922, Mr. Dal Piaz, chairman of the board of the French Line, dealt in a very comprehensive speech with various questions pertaining to the present position of the shipping trade in this country and the general overseas policy of France.

The returns and accounts of the company for the last year are far from being satisfactory since the total receipts amounted to 282,986,860 francs only, while the total of the expenditures for the same period was 262,781,341 francs: after deducting various charges, the net profit for the year under review works out to 155,821 francs only, and the board thus proposed that no dividend should be paid to shareholders, which proposal was agreed to by the shareholders.

Mr. Dal Piaz stated that the amount of the subvention which is granted to the company by the French Government in respect of the management of the mail service on the Havre-New York line has grown obviously insufficient in view of the increase in charges of all kinds which has been observed in the course of the last few years. For this reason the company has requested the Government to agree to a revision of the agreement of 1913 which still regulates the conditions of the subvention of the Government in that respect. A draft bill has been recently submitted to the Chamber of Deputies and it is hoped that the discussion thereon will take place in Parliament in the near future; such bill provides for a notable increase of the amount of the subvention.

At the same time Parliament will have to ratify the granting of a special subvention to the French Line which will enable them to place an order for a large new liner to be placed in service on the Havre-New York line in 1926. A second liner to be delivered in 1932 should be ordered by the company shortly after the first one. It is probable that these two liners will be ordered from the Chantier et Ateliers de Saint-Nazaire (Penhoet) which built the *Paris* and the *France*. These two liners should be built on the same lines as the *Paris*, in view of the satisfactory results obtained in service with the latter, which is a quadruple screw, turbine driven, oil burning vessel. The cost of these vessels should work out to about 100,000,000 francs each.

That the financial outlook of the company is improving is shown by the fact that the receipts for the first six months of 1923 have been 17 percent higher than for the corresponding period of 1922 while the expenditures have shown no increase.

## French to Build Submarines Under New Naval Budget

THE 1,000,000,000 franc ($62,500,000) naval budget voted upon by France recently provides for four 2,400-ton long distance cruising submarines. These submarines will cost at least 30,000,000 francs ($1,875,000) each, construction probably being started this year. The budget also provided money for thirty 1,100-ton submarines to cost 15,000,000 francs ($937,500) each.

The French navy now has about fifty submarines in service, including a number of good German submarines.

Owing to the nation's limited financial resources and also the restrictions of the Washington treaty, the French naval ministry wishes to increase the submarine program, and some money provided in the new budget for other craft will likely be devoted to laying down new submarines.

## Fiat Company Takes Over Turin Diesel Engine Works

TURIN, Italy.—Control of the Turin Diesel Engine Works, Via Cuneo, 20, formerly owned by the Ansaldo San Giorgio, has been acquired by the Fiat Company, original founders of the plant, which will carry on the business without change of personnel under the name of Fiat-Stabilimento Grandi Motori. The company will specialize in the construction of heavy oil, two-cycle engines for both marine and industrial purposes.



Generated on 2024-09-12 16:43 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

# Marine Construction News of the Month

## Ship Contracts — New Ship Concerns and Shipyard Improvements—Terminal Projects—Government Contracts

## SHIPBUILDING AND REPAIRS

**Extensive Damage Work, Toledo, O.**—The damaged steamer W. B. Schiller has been taken to Toledo for extensive repairs.

**Contract Awarded, Baltimore, Md.**—The lightship No. 52 has been awarded to the Spedden Shipbuilding Company for docking and repairs.

**Steamer Drydocked, Chester, Pa.**—The steamship W. D. Anderson has been drydocked at the Sun Shipbuilding & Dry Dock Company's yards, Chester, Pa.

**Steamer Repairs, Cleveland, O.**—The steamer S. J. Murphy, which broke her crankshaft on Lake Superior recently, has been towed to Cleveland for repairs.

**Plate Repairs, Buffalo, N. Y.**—The G. M. Wilson, a Boland & Cornelius boat, is in the Buffalo Dry Dock for repairs. Twenty-two plates are being replaced.

**Tug Repairs, Jacksonville, Fla.**—The tug Adler, of the Corona Coal Company of New Orleans, was taken to the Merrill-Stevens Dry Dock Company for repairs.

**Nine Steel Barges, Mobile, Ala.**—The Alabama Dry Dock & Shipbuilding Company is constructing nine steel barges for the Tennessee Coal and Iron Company.

**Collision Damage Repairs, Buffalo, N. Y.**—The steamer Duluth, which received damages recently in a collision, is being repaired at the Ranahan Shipyards.

**Steamer Repairs, Baltimore, Md.**—The Shipping Board has awarded the contract for repairs to the steamer Monmouth to Theodore H. Rohde, Inc., at a bid of $5,635.

**Conversion to Oil Burner, San Francisco, Cal.**—The Dollar Line steamer Stanley Dollar was awarded to the Bethlehem Shipbuilding Corporation, at a price of $27,186.

**Steamer Drydocked, Chester, Pa.**—The American steamship Conejos has been drydocked at the Sun Shipbuilding and Drydock Company's yards, Chester, for miscellaneous repairs.

**Vessel Repairs, San Francisco, Cal.**—At the opening of tenders for repairs to the steamer West Islip, the Main Iron Works, San Francisco, Cal., submitted the lowest bid.

**Plate Repairs, Lorain, O.**—The steamer Secandbee, recently damaged when it hit an obstruction in the Great Lakes, has been taken to Lorain for repairs to damaged plates.

**Broken Propeller Repairs, Charleston, S. C.**—The steamship West Irvis, a Shipping Board vessel, has been taken to the Charleston Navy Yard to have a broken propeller blade replaced.

**Voyage Repairs, San Francisco, Cal.**—The Bethlehem Shipbuilding Corporation was low bidder for voyage repairs to the steamer Elkridge, of the Shipping Board, at a price of $380.

**General Reconditioning, Baltimore, Md.**—The Curtis Bay Towing Company's tug Port Covington has been placed on the ways of the H. E. Crook Company for general reconditioning.

**Cleaning and General Repairs, San Francisco, Cal.**—The sea fighter Pennsylvania has been placed on the ways of the Bethlehem Shipbuilding Corporation for cleaning and general repairs.

**Repair Work, Portland, Ore.**—The steamer Pawlet, lighthouse tender Manzanita, for repairs; tug F. A. Douty, for repairs to propeller and to have her wheel fitted, were placed on the St. Johns drydock.

**Ferryboat Launched, Buffalo, N. Y.**—The new Grand Island ferry was launched recently and the finishing touches are now being completed by the Erie Basin Shipyards. The boat has been named the H. W. Long.

**Contract Awarded, Kearny, N. J.**—The contract for overhauling and general repairs to dredge No. 9, of the P. Sanford Ross Company, of Jersey City, has been awarded to the Federal Shipbuilding Company, at an approximate price of $16,000.

**Vessel Repairs, Philadelphia, Pa.**—The Cramp Shipbuilding Company is making repairs on the coastwise tug Prudence and Government dredge Orleans. The Shipping Board steamship Western Spirit is also being repaired at the same yard.

**Smooth Planked Dory, Staten Island, N. Y.**—Sealed proposals were received by the Superintendent of Lighthouses, Tompkinsville, Staten Island, N. Y., on July 24, for a 20-foot smooth planked Swampscott dory, equipped with gasoline engine.

**Shipyard Activities, San Francisco, Cal.**—The Bethlehem Shipbuilding Corporation received the following contracts: Admiral line steamer Admiral Farragut, general overhauling; transport Meiggs, general hull repairs; tankers Argyll and Lebec, general repairs.

**Freighter Launched, Cleveland, O.**—The American Shipbuilding Company recently launched the freighter Charles M. Schwab at Cleveland. The vessel has a length of 600 feet and is of 14,000 deadweight tons. She will be the largest boat in operation on the Great Lakes.

**Shipyard Activities, West Coast.**—The Eureka Boiler Works was low bidder for engine repairs on the liner Venezuela, of the Pacific Mail Company, and the United Engineering Company submitted the lowest figure for general repairs on the vessel, the prices being $554 and $681, respectively.

**Lightship Repair Bids, Oakland, Cal.**—At the opening of proposals for reconditioning Lightship No. 83 the Hanlon Drydock and Shipbuilding Company tendered a bid of $4,099. Other bids for the work were: Moore's, $4,230; De Young's, $4,786; General Engineering, $5,179, and Bethlehem, $5,550.

**Steamers Drydocked, Chester, Pa.**—Steamer Steel Navigator, of the Isthmian Steamship Line, has been drydocked at the Sun Shipyard, Chester, for miscellaneous repairs prior to going to a Far East berth. The West Irmo has also been drydocked at the same yard for miscellaneous repairs and painting.

**Shipyard Work, Mobile, Ala.**—The steamship Gaston, for renewal of keel shoeing, etc.; repairs on the West Corum; steamship Normania repairs; boiler repairs on Fruit steamship Venator, and miscellaneous overhauling of the steamship Edgefield, have been awarded to the Alabama Dry Dock and Shipbuilding Company.

**Low Bidder, San Francisco Cal.**—The General Engineering and Drydock Company was low bidder at the opening of tenders for repairs to the Government vessel George Armistead, which were as follows: General Engineering, $2,174; Smith & Scanlon, $2,321; Moore Drydock Company, $2,357, and Hanlon Shipbuilding and Drydock Company, $2,513.

**Large Repair Contract, Oakland, Cal.**—The Moore Drydock & Shipbuilding Company received the contract for making repairs to the boilers, renewal of nine furnaces and other general engineroom repairs, to the Moore & McCormack Company, Inc., intercoastal steamer Commercial Guide. The tender submitted by the Moore Company was around $47,000.

**Shipyard Activities, West Coast.**—The General Engineering Company received the contract for repair work on the steamer Meton, the following bids having been submitted: General Engineering, $5,883; Crowley's, $6,369; Smith & Scanlon, $6,770; Main Iron Works, $6,300; Moore Drydocks, $6,510; Bethlehem, $6,269, and United Engineering Company, $6,555. For scaling the vessel, the same company was also low, with a price of $4,775.

**Ferryboat Launched, Wilmington, Del.**—Pusey & Jones, Wilmington, Del., have launched the steel ferryboat Chelsea, which has been building for the Philadelphia & Reading Railway for service between Camden and Philadelphia. The boat is 200 feet long, 65 feet wide. Her sister ship, the Ocean City, now on the ways, will be completed in a few months.

**Bids for Barges, Memphis, Tenn.**—The Mississippi River Commission, First and Second Districts, Room 1006, McCall Building, Memphis, Tenn., received sealed proposals on July 18 for the construction of fourteen steel barges, the Dravo Contracting Company, of Pittsburgh, offering the lowest figure of $192,500. The proposed barges are to have a length of 120 feet, beam 30 feet.

**Lifeboats, Etc., Oakland, Cal.**—The Pacific Boat and Manufacturing Company, of Oakland, has been awarded a contract by the army transport service for the construction of eight lifeboats and two whale boats. The vessels will be of the latest design, equipped with life-saving equipment. The company recently delivered six lifeboats for the Southern Pacific Company for the new steamer Sacramento.

**Shipyard Activities, Oakland, Cal.**—The Hanlon Shipbuilding and Drydock Company was awarded the contract for extensive reconditioning of the Hartwood Lumber Company's vessel Avalon, consisting of the installation of a new tail shaft, new lead sleeve and extensive engine and hull repairs, as well as caulking. The revenue cutter Cahokia will go on drydock for repairs when the work on the Avalon is completed.

**Extensive Reconditioning, Mobile, Ala.**—The Alabama Dry Dock & Shipbuilding Company, Mobile, was awarded the following ship work: Steamship Cabrille, for examination, opening up of all main engine boilers and auxiliaries for inspection, entire outside scaling, four coats of paint, etc.; fruit steamer Venator, repairs; steamer Gaston, tug El Coloso, miscellaneous repairs; and steamer Westland, plate repairs, decks calked, engine repairs, etc.

**Two Ferryboats Reconditioning, Oakland, Cal.**—Ferryboat Cazadero, owned by the Northwestern Pacific Company, is being entirely reconstructed in Oakland shipyards, at a cost of $200,000, to put her in condition for increased passenger and automobile service between San Francisco and Sausalito. The Old Thoroughfare, of the Southern Pacific Company is also being rebuilt at the company's yard, to operate between Oakland and San Francisco.

**Vessel Contracts, Panama Canal Zone.**—The following vessels were recently taken to the Cristobal shops for repairs; launch Dalia, repairs to tail shaft, stern bearing, caulking deck seams, etc.; steamship Ulysses, scale and paint holds; submarine D-3, remove bow rudder, overhaul 10 gauges, clean and paint all tanks, and several other important repairs; tug Tavernilla, mineplanter Graham, steamships Acajutla, District of Columbia, Heffron, Balboa, Oriana, Ucayali, Cristobal, minor repairs.

**Contract Awarded, Baltimore, Md.**—Under proposals received and opened at the office of the United States District Engineer at Philadelphia, Pa., on June 22, the contract for four 50-foot steel motor tugs has been awarded to the Spedden Shipbuilding Company, of Baltimore, Md., the lowest bidder for the four tugs combined at a total price of $112,337, based on the installation of Kahlenberg 100-horsepower engines. Delivery of the tugs will be accepted by the United States at the shipyard of the contractor.

**Repair Work, Buffalo, N. Y.**—The Oldman-Magee Boiler Works, Buffalo, are completing repairs on



Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

the steamer Usona, of the White, Mitchel & Gratwick Line. They are rebuilding her hatches and deck and overhauling the boiler. The same yard has completed overhauling boilers of the British ship Belchers. Repairs are being made at the Riley Dry Dock Company to Barge No. 214, of the New York Canal & Great Lakes Corporation, four new plates, caulking and replacing of 500 rivets comprising the necessary work. New stern planks have been installed in Barge 501 belonging to the same company.

**Bids for Sternwheel Towboat, Memphis, Tenn.**—The Charles Ward Engineering Works, of Charleston, W. Va., with a price of $164,000 submitted the low bid for the construction of the steel hull stern wheel towboat, bids for which were opened at the United States Engineer Office, Nashville, Tenn., on July 16. There was one other bidder, the Dravo Contracting Company, of Pittsburgh, Pa., who offered a price of $189,000. The proposed boat is to have an overall length of 136 feet 7½ inches, breadth molded 29 feet, the propelling machinery to be of the surface condensing tandem compound type, designed for a working pressure of 250 pounds per square inch, the vessel to be modernly equipped throughout.

**Shipyard Activities, West Coast.**—The United Engineering Works tendered the lowest bid for general voyage repairs to the U. S. transport Grant, the prices submitted being as follows: United Engineering, $1,423; Hanlon's, $1,672; A. De Young, $1,713; Bethlehem, $1,738; Neptune Metal Works, $1,897, and Moore's, $1,987. The West Chopaka was discharged from the Bethlehem yard after completing cleaning and painting. The Mauna Ala is on the Bethlehem ways for cleaning, painting and to have her propeller changed; the Mexican steamers Oaxaca and Chihuahua were discharged from the Union Iron Works after undergoing repairs, and the Manoa and Sonoma are on the ways of the Bethlehem Shipbuilding Company for repairs. The Hanlon Shipyards are busy on the schooner Fred J. Wood and the steam yacht Virgana.

## PORT IMPROVEMENTS

**Sea Wall, etc., Greenwood, Miss.**—Plans are being made for a sea wall on the left bank of Yazoo River. $15,000. W. S. Hawkins, engineer.

**Grain Elevator, Hopkinsville, Ky.**—Acme Mills plan 40 by 100-foot grain elevator, 100 feet high, reinforced-concrete, 200,000 bushels capacity. To exceed $25,000.

**Levee, Waxahachie, Tex.**—Ellis Company, Levee District II, plans to reclaim 1,500 acres, levees on North Side of Chambers Creek. $52,000. W. H. Stovall, county judge.

**Dredging, Huron, Mich.**—U. S. Engineer, Detroit, awarded the contract for dredging Black River Channel, Port Huron, to Port Huron Sulphite & Paper Company. $12,700.

**Grain Elevator, etc., Pelican Rapids, Minn.**—H. E. Frazee is having plans prepared for a grain elevator and feed mill, brick and concrete. $40,000. Druar & Milinowski, 500 Globe Building, St. Paul, architects.

**Hydraulic Dredging, etc., Key West, Fla.**—Paul Boysen Development Company has had estimates made on 150,000 cubic yards of hydraulic dredging and fill. $37,500. B. Curry, Moreno, and P. Boysen, Key West, engineers.

**Channel Changes and Excavation Plans, Sioux City, Ia.**—The city is making plans for changing of the channel of Perry Creek, 50,000 cubic yards of excavation, etc. $335,000. L. N. Hintgen, Sioux City, engineer.

**Estuary Work, Tampa, Fla.**—The City Commissioners of Tampa, Fla., have awarded the contract for the work of constructing the new municipal port terminals on the Ybor estuary to McGuckin, McGuckin & Edwards, of Tampa.

**Contract Awarded, Ottawa, Ont.**—The Department of Public Works, Parliament Building, Ottawa, Ont., awarded the contract for dredging in the harbor of Ft. William and Port Arthur, to D. S. Pratt, Midland. Estimated cost $300,000.

**Dock and Terminal, Portland, Ore.**—The Oregon, Washington Railway and Navigation Company, Wells-Fargo Building, plans new Albina Street Dock, $228,000, and terminal, $197,488. S. Murray, assistant chief engineer, in charge of the work.

**Bulkhead Award, Pensacola, Fla.**—Specification 4837. Bureau of Yards and Docks, Navy Department, Washington, D. C., awarded the contract for replacing bulkhead at Naval Air Station, to C. H. Turner, 12½ South Palafax street. $31,994 (240 days).

**Pier, San Diego, Cal.**—Sealed proposals were received by City Council, July 11, for constructing a portion of mole type pier project, including concrete wharves, also sides and ends of pier wall. $300,000. F. G. White, Ferry Building, San Francisco, engineer.

**Grain Elevator, Fort Worth, Tex.**—Fort Worth Elevator Company, 1510 East 1st street, awarded the contract for a reinforced-concrete grain elevator, 1,750,000 bushels capacity, to Southwestern Engineering Company, Woodruff Building, Springfield, Mo. $1,500,000.

**Wharf and Dock, Detroit, Mich.**—The Public Lighting Commission, Atwater street, East, awarded the contract for a reinforced-concrete wharf and dock, at site of proposed lighting plant, to Greiling Brothers, 100 Blk. East Walnut street, Green Bay, Wis. $417,400.

**Piers, San Francisco, Cal.**—State Board of Harbor Commissioners, Ferry Building, is having preliminary plans prepared for three piers, from 285 feet to 350 feet wide and from 1,200 to 1,500 feet long, with sheds 115 feet wide. F. G. White, Ferry Building, chief engineer.

**Air Compressor, etc., for Grain Elevator, New Orleans, La.**—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, Suite 200, New Court Building, July 19, for furnishing an air compressor and receiver for the public grain elevator. Requisition G. E. 1445.

**Dike, etc., Biron (Wisconsin Rapids P. O.), Wis.**—Consolidated Water Power & Paper Co., Wisconsin Rapids, awarded a contract to Rood Construction Company, Wisconsin Rapids, for a 2-mile dike, 100,000 cubic yards, approximately 10,000 cubic yards of rip rap, 10,000 cubic yards of rock excavation, in connection with drainage project.

**Dock and Boat Basin, Sanford, Fla.**—The contract for furnishing for a dock and boat basin, 24,000 cubic yards of hydraulic sand fill, 1,750 cubic yards of reinforced-concrete, 35,000 lineal feet of wood piling, 76,000 pounds of steel, 11,000 feet creosoted timber, etc., was awarded to the Interstate Contracting Company, Sanford, at a price of $68,887.

**Hydraulic Dredging, New Orleans, La.**—Sealed proposals were received by the Board of Commissioners of the Port of New Orleans, at their office, Suite 200, New Court Building, July 26, for hydraulic dredging from 750,000 to 1,500,000 cubic yards in the Inner Harbor Navigation Canal between the Lock and Louisville and Nashville Railroad bridge. J. H. Walsh, general manager.

**Sea Wall or Flood Protection, Vicksburg, Miss.**—Sealed proposals for the construction of a concrete wall along the river front at Vicksburg, Mississippi, were received at the City Hall, July 2, approximately 4,200 lineal feet of wall containing about 9,500 cubic yards of concrete, 450 tons of reinforcing steel and 4,200 lineal feet of interlocking sheet piling 10 to 20 feet long, being contained in the work.

**Slip to Be Enlarged, Baltimore, Md.**—The slip at the Merchants & Miners Transportation Company's docks is to be dredged out twelve feet further back towards Bay street, steel piling and a concrete bulkhead will then be installed and the whole slip dredged to the same depth. This work is being done by the company to facilitate the loading and unloading of its two new ships, the Alleghany and Berkshire.

**Inlet Improvement, Fort Pierce, Fla.**—A bond issue of $220,000 has been authorized for the improvement of the Fort Pierce Inlet to provide a channel depth of 14 feet and extend the jetties a sufficient distance east and west to adequately protect the project. The Fort Pierce Finance and Construction Company will provide the ship channel, turning basin and pier in connection with the building of a causeway across Indian River.

**Jetty Contract, Wilmington, N. C.**—The contract for building a series of jetties along the Wrightsville Beach ocean front has been awarded to Jesse A. Howland of Sea Bright, N. J. The price for carrying out the work is $27,721.50. There are to be five different jetties, the extreme ones being about one and one-half miles apart. One will jut out at a point north of the Oceanic hotel, one south of Lumina and the three remaining will be placed at varying intervals along the beach. They will vary in length from 250 to 350 feet. The material will be wooden sheet-piling.

**Wharf and Grain Elevator, Portland, Ore.**—Oregon, Washington Railway and Navigation Company, Montgomery Ward Building, has had plans prepared for a 137 by 360 foot wharf at Albina Dock, covered shed 24 feet high, 180 feet double track trestle, 80 by 120 foot open wharf, wheat elevator, 104 feet high, capacity 310,000 bushels, and 119 by 350 foot warehouse. $220,000. S. Murray, Montgomery Ward Building, assistant chief engineer.

## NEW INCORPORATIONS

The Pacific-Caribbean-Gulf Line, capital $1,000,000, chartered under Delaware laws.

The Callaghan Transportation Corporation, capital $100,000, chartered under Delaware laws.

Western Transit Corporation, capital $100,000, chartered in Delaware, to build and operate boats.

The Nautilus Steamship Corporation of Manhattan has increased its capitalization from $800,000 to $900,000.

The Pacific-Caribbean-Gulf Line, capital $1,000,000, chartered under Delaware laws. Incorporators: Steele Steamship Line.

The General Marine Salvage Corporation, capital $750,000, chartered under Delaware laws. Corporation Trust Company of America, registrars.

The General Marine Salvage Corporation, capital $750,000, incorporated under Delaware laws. Corporation Trust Company of America, registrars.

California-New York Steamship Company, capital $12,500,000, incorporated in Delaware. Delaware Incorporating Company, registrars, Wilmington.

The C. & G. Salvage Corporation, of Manhattan, capital $100,000, chartered at Albany. Incorporators: B. & J. P. Greenstone and A. M. Garbade.

The Bison Steamship Corporation, of Tonawanda, N. Y., capital $150,000, chartered at Albany. Incorporators: J. J. and M. O'Hagan and J. Gehm.

The Morecraft Transportation Corporation, of Wilmington, Del., capital $500,000, incorporated under Delaware laws, to engage in the operation of boats.

Intercoastal Shipping Service, of Manhattan, capital $20,000, chartered under New York laws. Incorporators: G. V. Reilly, S. C. Wood and H. C. Hand.

The International Trade Developer Corporation, to foster world trade, capital $1,000,000, incorporated in Delaware. Incorporators: Z. G. Dunn, C. H. Stanley and A. J. Brook, of Chicago.

The New York, Atlantic City and Philadelphia Steamship Company, capital $2,000,000, incorporated in New York. The beginning of this line will give Philadelphia two services to New York.

The Diesel Steamship Company, capital $25,500,000, chartered under Delaware laws. Incorporators: Edward Whitton, of Chatham, N. J.; Edwin A. Quick, of Brooklyn, and P. Tyson, of New York.

The Mexican, American Fruit & Steamship Corporation, capital $12,000,000, organized under Delaware laws. Incorporators: F. J. Porter, Montgomery B. Angell and Otis T. Bradley, of New York.

The Pacific Mail Corporation, capital $1,000,000, incorporated under Delaware laws. Incorporators: F. M. Stokes, of Woodhaven, L. I.; Joseph F. Mann, of Bloomfield, N. J., and William D. Ahearn, of Brooklyn.

Philadelphia Derrick & Salvage Corporation, capital $500,000, incorporated in Delaware. Incorporators: Clinton E. Rowe, of Whitestone, New York: Charles P. Kramer, of Far Rockaway, N. Y., and Joseph Lilly, of Brooklyn.

United American Terminals, to do wharfage and freighting, capital $100,000, chartered under Delaware laws. Incorporators: Eugene C. Tobey, of New York; Allen W. Lishawa, of East Orange, and William T. Dunn, of Long Island City.

The Knowl Trading Company, capital $100,000, incorporated under Delaware laws, to do business as shipbrokers. Incorporators: George S. Brengle, of Arlington, N. J.; Hurlburt McAndrews, of Mam-

Generated on 2024-09-12 16:23 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

aroneck, N. Y., and P. J. R. McIntercert, of New York.

The McCormick Steamship Company of San Francisco, capital $500,000, has been reorganized with the following officers: Charles R. McCormick, president; Sydney M. Hauptman, vice-president; Charles L. Heutter, second vice-president and general manager, and J. S. Brown, secretary and treasurer. John M. Hencken has been appointed operating manager of the company, and J. C. Strittmatter, freight manager. The Munson-McCormick Line operate a joint inter-coastal service.

## GOVERNMENT WORK

**Dredging, Galveston, Tex.**—U. S. Engineer Office, Galveston, received bids July 20 for dredging the Houston Ship Channel.

**Dredging, Galveston, Tex.**—Bids were received July 21, at the office of the United States Engineer, Galveston, for dredging in Texas City Channel.

**Bids Rejected, Milwaukee, Wis.**—U. S. Engineer, Federal Building, Milwaukee, rejected bids for dredging approximately 450,000 cubic yards at Green Bay, Wis.

**Dike, St. Louis, Mo.**—United States War Department, Federal Building, Kansas City, plans concrete and rubble dike at mouth of Missouri River, near St. Louis.

**Dredging, New Jersey.**—U. S. Engineer Office, Wilmington, Del., received sealed proposals, July 9, for dredging Maurice and Cohansey Rivers, N. J. Further information on application.

**Six Dump Scows, Louisville, Ky.**—Sealed proposals were received by U. S. Engineer Office, July 16, for furnishing and delivering six steel dump scows. Further information on application.

**Dredging, New Orleans, La.**—Sealed proposals were received by the U. S. Engineer Office, New Orleans, July 19, for dredging in the Calcasieu-Sabine section of the Intracoastal Waterway.

**Dredging, Detroit, Mich.**—U. S. Engineer, 337 Federal Building, Detroit, plans dredging Saginaw River to restore 18.5 feet of channel in Saginaw Bay and 16.5 feet channel in Saginaw River.

**Steel Derrick Boat, St. Paul, Minn.**—Sealed proposals were received by United States Engineer Office, July 31, for constructing and delivering a steel derrick boat. Further information on application.

**Dredging, Providence, R. I.**—U. S. Engineer, Providence, awarded the contract for dredging in Duck Island Harbor, Conn., to Columbia Dredging Company, 30 Church street, New York City. $36,800.

**Excavation, Wilmington, Del.**—U. S. Engineer, Wilmington, Del., will receive sealed proposals until August 2 for excavating the inland waterway from Delaware River to Chesapeake Bay, Delaware and Maryland.

**Reboilering Tug, Florence, Ala.**—The United States Engineer Office of the War Department, Florence, Ala., is reboilering the tug General John Coffee. Foster radiant heat type superheaters are to be installed.

**Fourteen Steel Barges, Memphis, Tenn.**—The Mississippi River Commission, First and Second Districts, Room 1006, McCall Building, Memphis, received sealed proposals July 18 for furnishing fourteen steel barges.

**Dike, New York, N. Y.**—U. S. Engineer, 616 Army Building, awarded the contract for a 3,400-foot timber dike north of Shooters Island, New York and New Jersey, to Rhodes & Manvel, Inc., 90 West street. $75,785.

**Contract Awarded, Nashville, Tenn.**—U. S. Engineer, Custom House, awarded the contract for 365,000 feet of yellow pine timber for Lock and Dam 8, Cumberland River, to Great Southern Lumber Company, Bogalusa, La. $18,000.

**Stone for Rubble Mound, Alpena Harbor, Mich.**—Sealed proposals were received by the United States Engineer Office, Detroit, Mich., July 30, for furnishing and placing stone for rubble mound at Alpena Harbor, Mich. Further information on application.

**Breakwater, Alpena, Mich.**—Bids will be received by U. S. Engineer Office, 337 Federal Building, Detroit, until July 30 for 11,700 tons of core and 10,300 tons of Armor stone, etc., for a rubble mound breakwater, 1,030 feet long at the southerly side of the river mouth.

**Derrick Boat, Memphis, Tenn.**—Sealed proposals were received at the office of the Mississippi River Commission, First and Second Districts, Room 1006, McCall Building, Memphis, Tenn., July 19, for furnishing one 25-ton steel derrick boat, complete. Further information on application.

**Contracts Awarded, Los Angeles, Cal.**—The United States Engineer Office, Los Angeles, awarded the contract for the dredging of the main channel of Los Angeles Harbor to widen it from 500 to 1,000 feet, to the San Francisco Dredging Company and the Fred C. Frank Construction Company.

**Stone Riprap, Keweenaw Waterway, Mich.**—Sealed proposals were received by the U. S. Engineer Office, Duluth, Minn., July 3, for removing timber superstructure and furnishing and placing stone riprap along and on the west breakwater, Upper Entrance of the above waterway. Further information on application.

**Bids Rejected, Buffalo, N. Y.**—The U. S. Engineer Office, Federal Building, Buffalo, opened bids on the twentieth for dredging and rock excavations in the Black Rock Canal, Buffalo. All bids were deemed too high, and part of the work, consisting of the triangular area, will be re-advertised, probably about September 1.

**Runners, Wilmington, Del.**—Sealed proposals, in duplicate, will be received at the U. S. Engineer Office, Wilmington, N. C., for two runners, port and starboard, for 15-inch pumps in dredge Comstock, the runners to be cast steel, machined, bored, keyseated, fitted with inboard and outboard liners, ready to install, delivered f. o. b. cars, Wilmington, N. C.

**Harbor Improvement, Philadelphia, Pa.**—The contract for dredging in Delaware River, Philadelphia Harbor, 201,000 cubic yards excavation, minimum allowable over depth 84,000 cubic yards, has been awarded to the American Dredging Company, Mariner and Merchant Building, Philadelphia, by the United States Engineer Office, 815 Witherspoon Building. Price $68,340.

**Sale of Used Equipment, Panama Canal.**—Sealed proposals for the purchase of railroad, marine construction, mechanical, electrical, and miscellaneous equipment, will be received at the office of the General Purchasing Officer, The Panama Canal, Washington, D. C., until 10:30 o'clock a. m., August 2, 1923, at which time they will be opened in public for purchasing the above-mentioned equipment. Blanks and information relative to this circular (1525) may be obtained from this office. A. L. Flint, General Purchasing Officer.

## MARINE SOCIETIES

### AMERICA

**American Society of Naval Engineers**
Navy Department, Washington, D. C.
Secretary-Treasurer—Commander S. M. Robinson, U. S. N., Bureau of Engineering, Navy Department, Washington, D. C.

**Society of Naval Architects and Marine Engineers**
29 West 39th Street, New York
Secretary and Treasurer—Daniel H. Cox.

**National Association of Engine and Boat Manufacturers**
29 West 39th Street, New York City
Secretary—R. R. A. Hand.

**United States Naval Institute**
Naval Academy, Annapolis, Md.
Secretary and Treasurer—Commander H. K. Hewitt, U. S. N.

**American Marine Association**
15 Park Row, New York
President—E. A. Simmons.
Secretary—K. W. Heinrich.

**The New York Tow Boat Exchange**
11 Moore St., New York.
Secretary—Irving G. Keller.

**Port of New York Authority**
11 Broadway, New York
Chairman—E. H. Outerbridge.
Secretary—William Leary.

**Marine Engineers' Supply Men's Association**
Room 507, 30 Church Street, New York.
Secretary—Robert P. Jones.

**National Association of Masters, Mates and Pilots**
National Secretary—M. D. Tenniswood, 308 Vine St., Camden, N. J.

**American Society of Marine Designers**
Secretary—B. G. Barnes, 202 Kendrick Ave., Quincy, Mass.

**National Marine Engineers' Beneficial Association**
Headquarters 311-315 Machinists Building, Washington, D. C.
Secretary-Treasurer—George A. Grubb.

**Atlantic Coast Shipbuilders' Association**
1701 Walnut Street, Philadelphia, Pa.
Secretary—C. S. King.

**American Steamship Owners' Association**
11 Broadway, New York
President—A. G. Smith.
Vice-President and General Manager—Winthrop L. Marvin.

**United States Ship Operators' Association**
149 Broadway, New York
President—C. H. Potter.

**National Merchant Marine Association**
Munsey Bldg., Washington, D. C.
President—Hon. J. E. Ransdell.

**The Maritime Association of the Port of New York**
78 Broad St., New York City
President—Charles H. Potter.
Secretary—Walter F. Firth.

**Lake Carriers' Association**
Detroit, Mich.
Secretary—George A. Marr.

**Neptune Association**
21 Pearl St., New York City
Secretary-Treasurer—Captain John F. Milliken.

**Ocean Association of Marine Engineers**
15 Whitehall St., New York City
Secretary—Bert L. Todd.

### CANADA

**Grand Council N. A. of M. E. of Canada**
Grand Secretary-Treasurer—Neil J. Morrison, Box 886, St. John, N. B.

### GREAT BRITAIN

**Institution of Naval Architects**
5 Adelphi Terrace, London, W. C.

**Institution of Engineers and Shipbuilders in Scotland**
39 Elmbank Crescent, Glasgow.

**Northeast Coast Institution of Engineers and Shipbuilders**
Bolbec Hall, Westgate Road, Newcastle-on-Tyne.

**Institute of Marine Engineers, Incorporated**
The Minories, Tower Hill, London.

### ITALY

**Collegio Degli Ingegneri Navale Meccanici in Italia**

Generated on 2024-09-12 16:20 GMT / https://hdl.handle.net/2027/uiug.30112107041326
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN